

Grade 9 EQAO Assessment of Mathematics

Applied

Student Preparation Booklet

Name: _____

Teacher: _____

School: _____

Contents: Key Words
Strategies for Multiple Choice and Open Response Questions
EQAO Formula Sheet
Sample Questions from the 2009-10 Assessment
Sample Questions from the Winter 2009 Assessment
Sample Questions from the Spring 2009 Assessment
Sample Questions from the Winter 2008 Assessment
Sample Questions from the Spring 2008 Assessment

Grade 9 EQAO Assessment of Mathematics

Key Words

Throughout the assessment, key words are used to identify the type of response required from you. The key words are explained below. Refer to this sheet to make sure you are responding fully to each question.

Compare:

Tell what is the same and what is different.

Describe:

Use words to create a mental picture for the reader.

Determine:

Use mathematics to find a solution to the problem.

List:

Use point form.

Explain:

Use words and symbols to make your solution clear.

Justify:

Give reasons and evidence to show your answer is correct.

Show your work:

Record all calculations and all the steps you went through to get your answer. You may use words, numbers, graphs, diagrams, symbols and/or charts.

Tools you should have access to:

- Pencil, ruler and eraser
- Scientific or Graphing calculator (You may not share with another student)
- Manipulatives (examples: algebra tiles, linking cubes, integer counters, 3D solids, 2D shapes ...)

Strategies for Multiple Choice Questions:

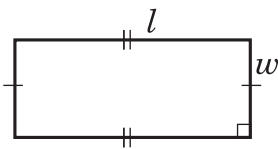
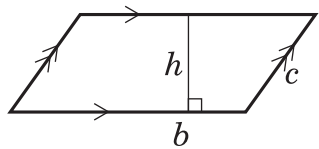
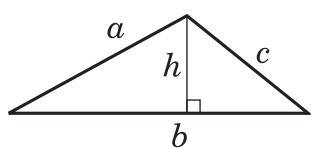
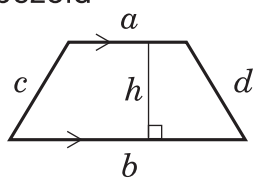
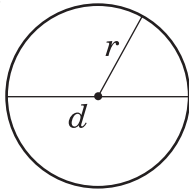
1. Cover the question choices and read the question stem carefully and highlight key words with a highlighter, especially the key words on the previous page.
2. Look at the choices and eliminate any of the responses that are not possible.
3. There is only **one** answer per question. Choose the best possible answer and shade your choice on the answer sheet.
4. Answer every question; there are no penalties for guessing.
5. Questions that have a graph are drawn to scale. Questions that have a diagram are usually not drawn to scale.

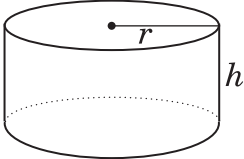
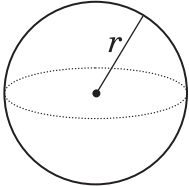
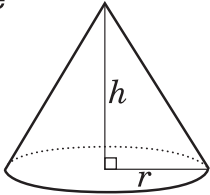
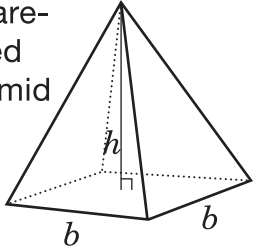
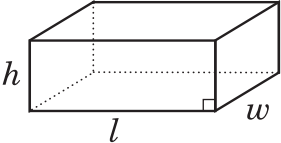
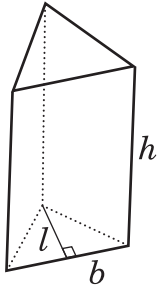
Strategies for Open Response Questions:

1. These questions are designed to get you to think deeply about the mathematics you know. Complete solutions including any rough work are expected for these questions.
2. Read the question carefully and highlight any key words or information with a highlighter.
3. Write your solution in the space provided.
4. Don't erase any of your calculations, drawing or reasoning. Scorers want to see all your work.
5. Use the list of key words on the previous page to help you decide what is expected in your answer. For example, **explain** means to use words and symbols to make your solution clear and understandable.
6. The problems in these questions often have more than one way of being solved. Be sure to clearly explain your solution using pictures numbers and words.

Formula Sheet

Grade 9 Applied

Geometric Figure	Perimeter	Area
<p>Rectangle</p> 	$P = l + l + w + w$ or $P = 2(l + w)$	$A = lw$
<p>Parallelogram</p> 	$P = b + b + c + c$ or $P = 2(b + c)$	$A = bh$
<p>Triangle</p> 	$P = a + b + c$	$A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$
<p>Trapezoid</p> 	$P = a + b + c + d$	$A = \frac{(a + b)h}{2}$ or $A = \frac{1}{2}(a + b)h$
<p>Circle</p> 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

Geometric Figure	Volume
Cylinder 	$V = (\text{area of base})(\text{height})$ $V = \pi r^2 h$
Sphere 	$V = \frac{4}{3} \pi r^3 \quad \text{or} \quad V = \frac{4\pi r^3}{3}$
Cone 	$V = \frac{(\text{area of base})(\text{height})}{3}$ $V = \frac{1}{3} \pi r^2 h \quad \text{or} \quad V = \frac{\pi r^2 h}{3}$
Square-based pyramid 	$V = \frac{(\text{area of base})(\text{height})}{3}$ $V = \frac{1}{3} b^2 h \quad \text{or} \quad V = \frac{b^2 h}{3}$
Rectangular prism 	$V = (\text{area of base})(\text{height})$ $V = lwh$
Triangular prism 	$V = (\text{area of base})(\text{height})$ $V = \frac{1}{2} blh \quad \text{or} \quad V = \frac{blh}{2}$

Applied

Grade 9 Assessment of Mathematics

2010

SAMPLE ASSESSMENT QUESTIONS

**Record your answers to the multiple-choice questions
on the Student Answer Sheet (2010, Applied).**

Education Quality and
Accountability Office



Please note: The format of
this booklet is different from
that used for the assessment.
The items themselves remain
the same.

- 1** Tommy uses the proportion below to determine the amount of butter, x , to use with 120 grams of sugar in his cookie recipe.

$$\frac{2}{3} = \frac{x}{120}$$

How many grams of butter does Tommy need?

- a 40
- b 80
- c 180
- d 240

- 2** The chart below shows the mass and the cost for different brands of cookies.

Brand	Mass (g)	Cost (\$)
1	200	1.99
2	250	2.29
3	300	2.89
4	450	4.29

Which brand costs the least per gram?

- a Brand 1
- b Brand 2
- c Brand 3
- d Brand 4

- 3** Tierney goes to the movie theatre and has \$20 to spend on treats.

Soft drink	\$2.29
Chocolate bars	\$1.69
Popcorn	\$3.49

She buys two soft drinks, a chocolate bar and popcorn. She also pays 13% tax.

How much change should Tierney receive from her \$20?

- a \$8.97
- b \$9.76
- c \$11.03
- d \$11.55

- 4** There are 260 Grade 9 students at a high school and 80% of these students attend a dance. Half the Grade 9 students who attend the dance buy their tickets at the door.

How many Grade 9 students who attend the dance buy their tickets at the door?

- a 40
- b 104
- c 130
- d 208

- 5** Which expression represents the volume of a cube with a side length of x ?

- a x^2
- b x^3
- c $3x$
- d $6x$

- 6** What is the value of the expression $\left(\frac{x}{3}\right)^2$ when $x = 18$?
- a** 2
 - b** 12
 - c** 36
 - d** 108
- 7** The cost of a phone call at a hotel is determined by the formula $C = 0.35t + 0.6$ where C is the cost, in dollars, and t is the length of the call, in minutes.
- What is the length of a call that costs \$5.85?
- a** 3 minutes
 - b** 6 minutes
 - c** 15 minutes
 - d** 18 minutes



8 Fill 'Er Up

The table below shows the cost of water for three customers. They each pay the same cost per litre.

Amount (L)	Cost (\$)
10 000	8.60
20 000	17.20
30 000	25.80

Frank pays \$36.12 for water at the same rate.

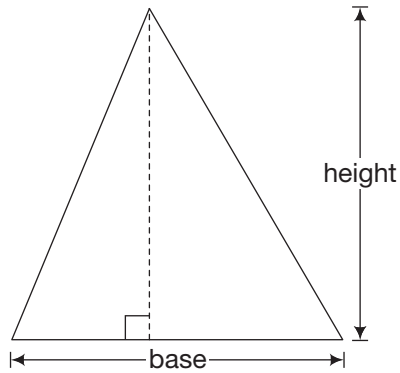
Determine the number of litres of water that he purchases.

Show your work.



9 Sail Away

Alain designs a sail in the shape of a triangle for a boat.



The base and height are equal. The area of the sail is 18 m^2 .

Determine the height of the sail.

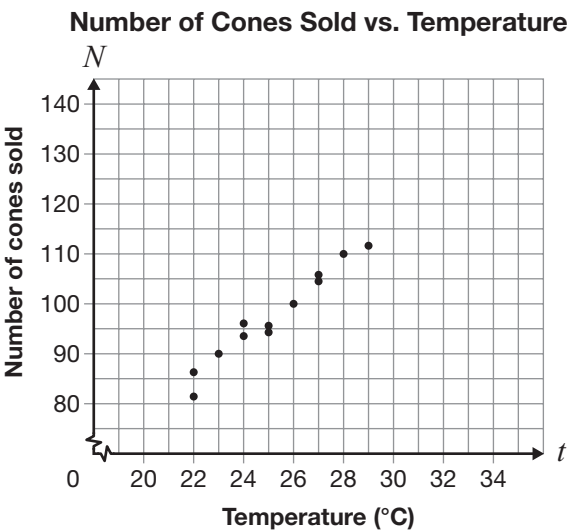
Hint:

$$A = \frac{bh}{2}$$

Show your work.

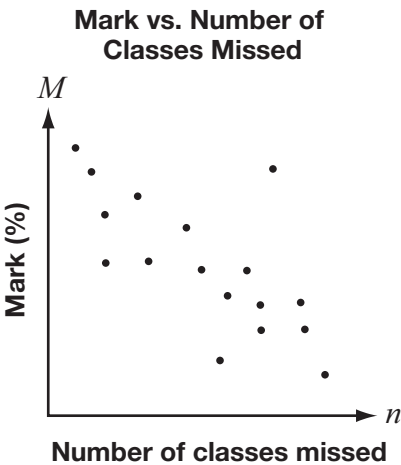
The height of the sail is _____.

- 10 Malia records the number of ice cream cones she sells each day and the maximum daily temperature, as shown on the graph below.



According to this graph, approximately how many ice cream cones will Malia sell on a day when the maximum temperature is 36°?

- a 80
 - b 110
 - c 115
 - d 135
- 11 This graph shows the relationship between students' marks and the number of classes that they have missed.



Which line of best fit is most appropriate for the data?

- a

A scatter plot with 'Mark (%)' on the y-axis (labeled M) and 'Number of classes missed' on the x-axis (labeled n). The data points are scattered around a horizontal line, indicating no clear linear trend.
- b

A scatter plot with 'Mark (%)' on the y-axis (labeled M) and 'Number of classes missed' on the x-axis (labeled n). The data points are scattered around a line with a steep negative slope, indicating a strong negative correlation.
- c

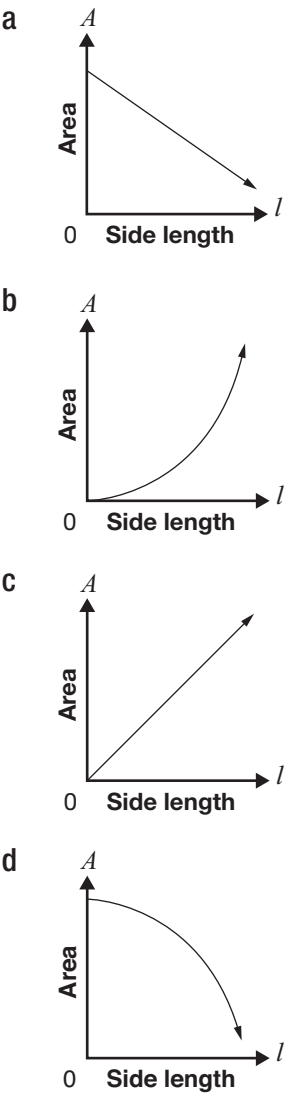
A scatter plot with 'Mark (%)' on the y-axis (labeled M) and 'Number of classes missed' on the x-axis (labeled n). The data points are scattered around a line with a moderate negative slope, indicating a moderate negative correlation.
- d

A scatter plot with 'Mark (%)' on the y-axis (labeled M) and 'Number of classes missed' on the x-axis (labeled n). The data points are scattered around a line with a steep positive slope, indicating a strong positive correlation.

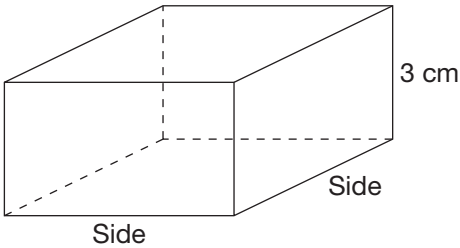
- 12** A student creates a table to show the relationship between the side length of a square and its area.

Side length	Area
1	1
2	4
3	9
4	16
5	25

Which of the graphs below best represents this relationship?



- 13** The square-based prism below has a height of 3 cm.



Hint:
 $V = (\text{area of base})(\text{height})$

Which table represents the relationship between the side length and the volume of this prism?

a

Side length (cm)	Volume (cm ³)
1	3
2	12
3	27
4	48
5	75

b

Side length (cm)	Volume (cm ³)
1	3
2	6
3	9
4	12
5	15

c

Side length (cm)	Volume (cm ³)
1	1
2	4
3	9
4	16
5	25

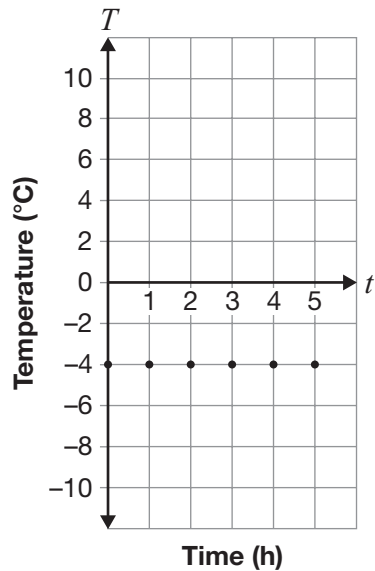
d

Side length (cm)	Volume (cm ³)
1	1
2	8
3	27
4	64
5	125

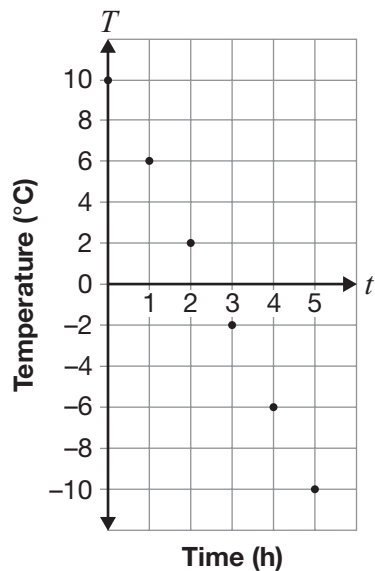
14 The following graphs represent a linear relationship between temperature and time.

Which graph has a rate of change of $-4\text{ }^{\circ}\text{C}$ per hour?

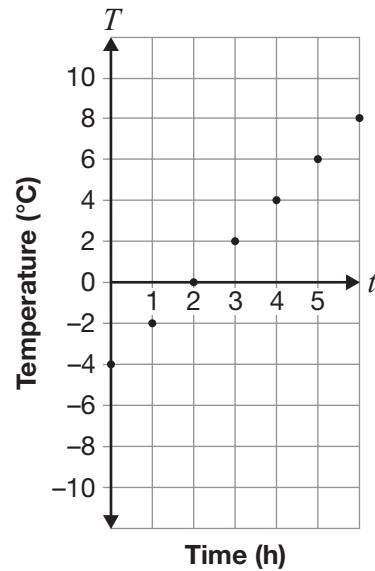
a Temperature vs. Time



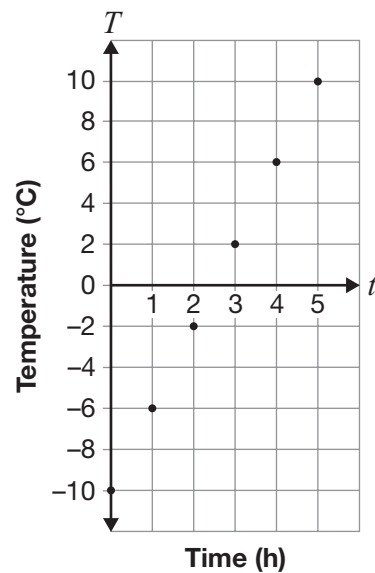
b Temperature vs. Time



c Temperature vs. Time



d Temperature vs. Time



- 15** Sarah is running a 40 km race at a steady pace of 10 km/h.

Which equation represents the distance Sarah has left to run after she starts if D is the distance in kilometres and t is the time in hours since she started the race?

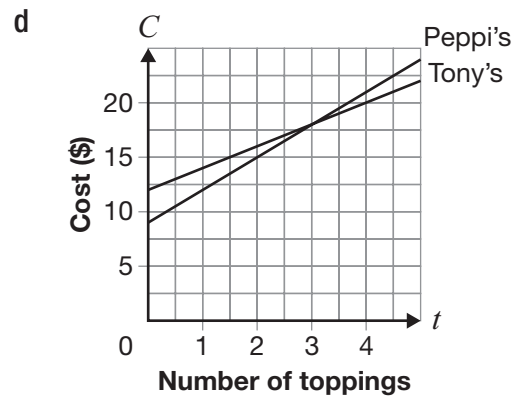
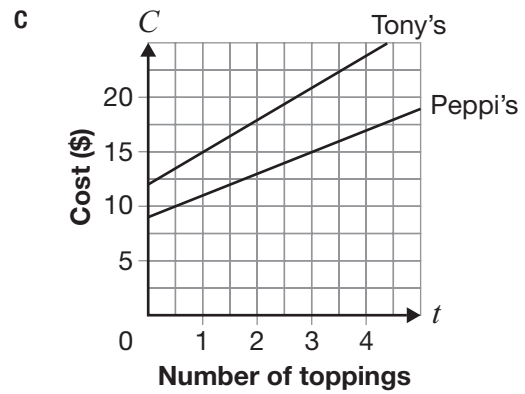
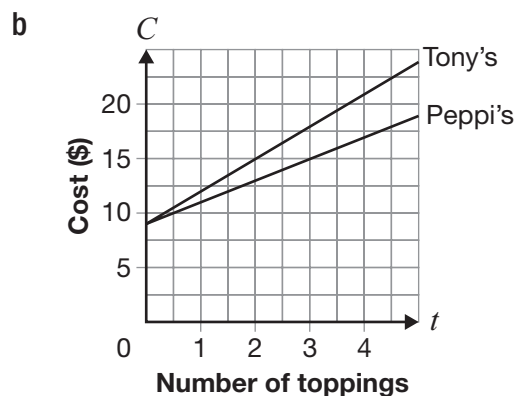
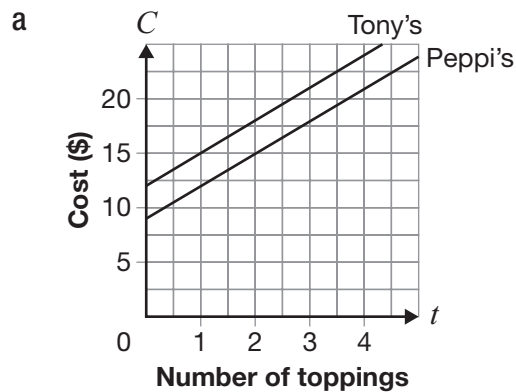
- a $D = 40 - 10t$
- b $D = 40 + 10t$
- c $D = 10 - 40t$
- d $D = 10 + 40t$

- 16** The equations for the cost of a pizza at two restaurants are shown below, where C represents the cost in dollars and t represents the number of toppings.

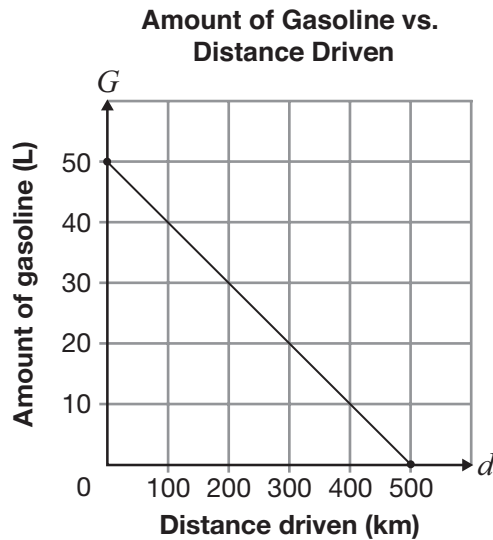
Peppi's Pizzeria $C = 9 + 3t$

Tony's Pizza $C = 12 + 2t$

Which graph best represents the cost of a pizza at each restaurant?



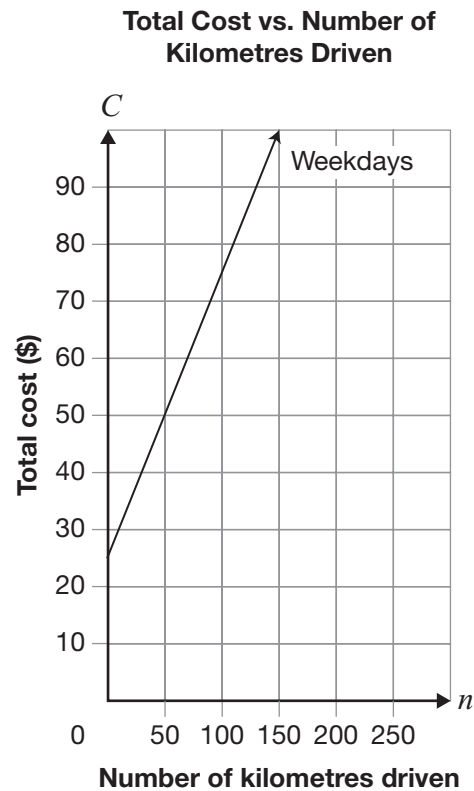
- 17** The graph below illustrates the relationship between the distance driven and the amount of gasoline in the tank of a car.



How many litres of gasoline are in the car's tank when the distance driven is 300 km?

- a** 10
b 20
c 40
d 50
- 18** One day, the temperature at 5 p.m. is 4°C . For the next 6 hours, the temperature drops 2°C every hour. What is the temperature at 11 p.m.?
- a** 2°C
b -2°C
c -6°C
d -8°C

- 19** The total cost of renting a car on weekdays is represented by the graph below.



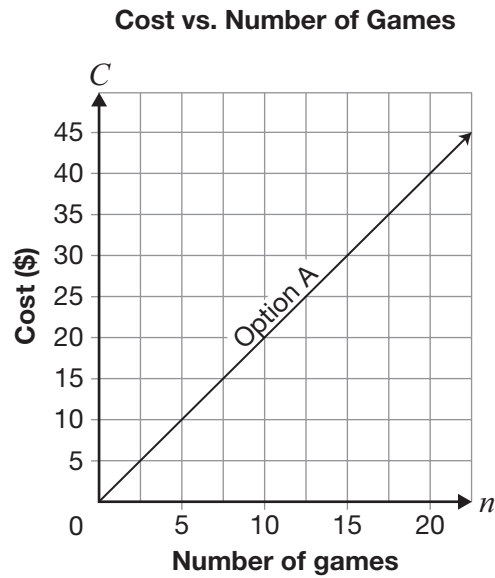
On weekends, the flat fee remains the same but the cost per kilometre is less.

Which of the following statements is true about the graph for weekends?

- a** The weekend graph goes through the point (0, 0).
b The weekend graph stays the same as the weekday graph.
c The initial cost is the same but the weekend graph is steeper than the weekday graph.
d The initial cost is the same but the weekend graph is less steep than the weekday graph.

- 20** Parallel Pines Bowling Alley offers two options.

A graph representing the cost of Option A is shown below.



Option B charges \$30 for unlimited bowling.

Which of the following is true?

- a Option A is always cheaper.
- b Option B is always cheaper.
- c Option A is cheaper for fewer than 15 games.
- d Option B is cheaper for fewer than 15 games.



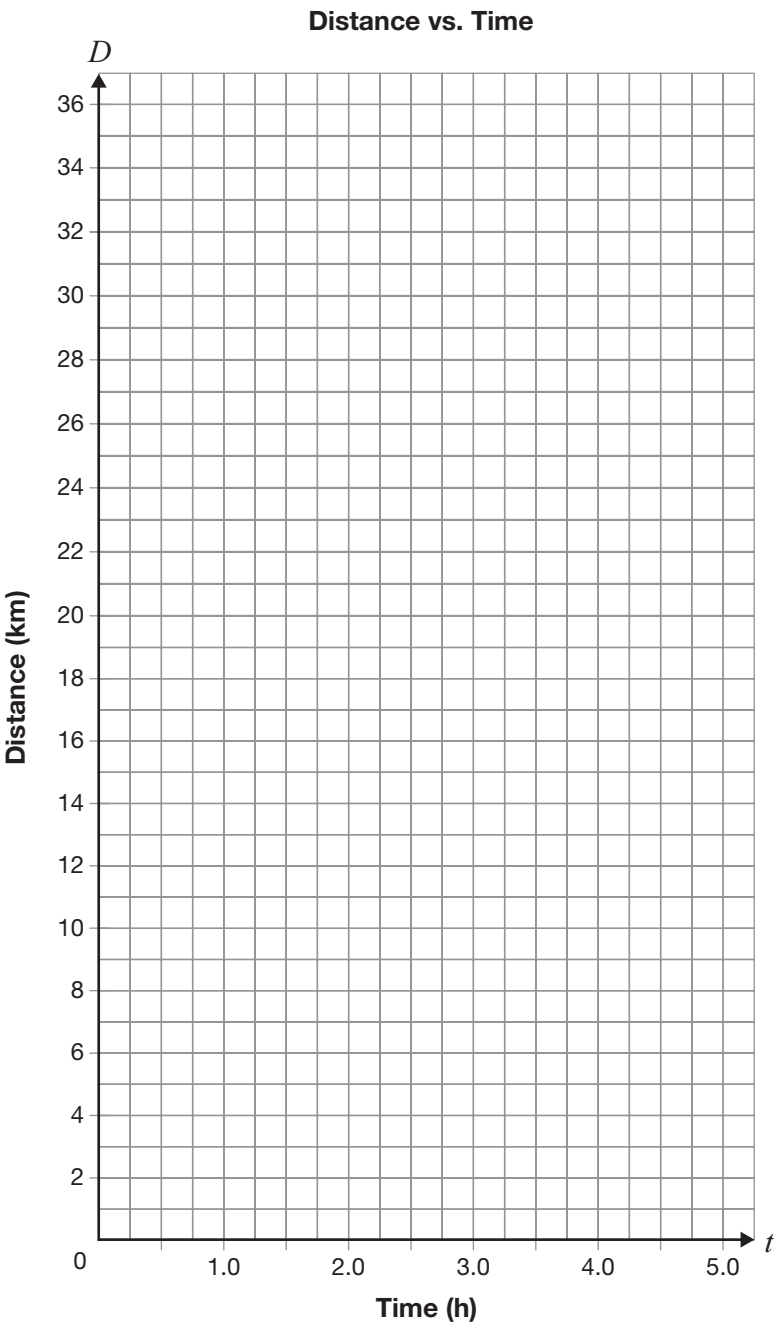
21 **Marathon Man**

Manny is running a race at a constant rate. He records his distance from the starting line at particular times as shown below.

Complete the table for this linear relationship.

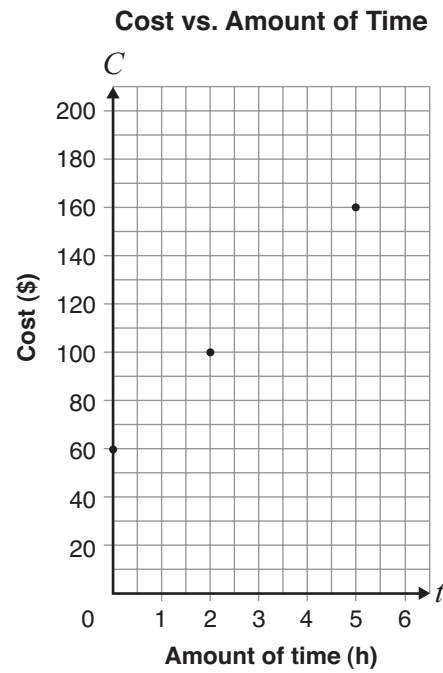
Time, t (h)	Distance, D (km)
0.5	3.5
1.0	
1.5	10.5
2.0	14.0
3.0	
5.0	

Graph this relationship on the grid.



22 Gym Time

The graph below shows the relationship between the cost of renting a gym and the amount of time the gym is used.



Determine the hourly rental rate.

The hourly rental rate is _____.

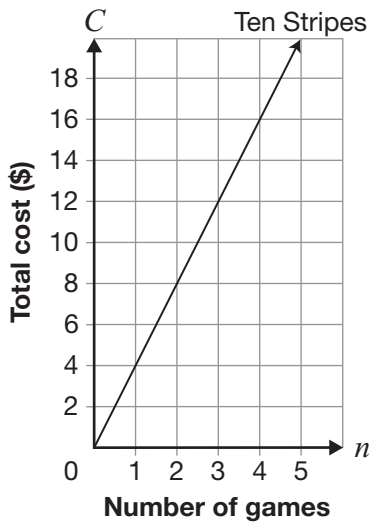
Show your work.

23 Bowling Variations

There are two bowling alleys in town.

The total cost of bowling at Ten Stripes Bowling is represented by the graph below. Ten Stripes offers free shoe rental.

Total Cost vs. Number of Games

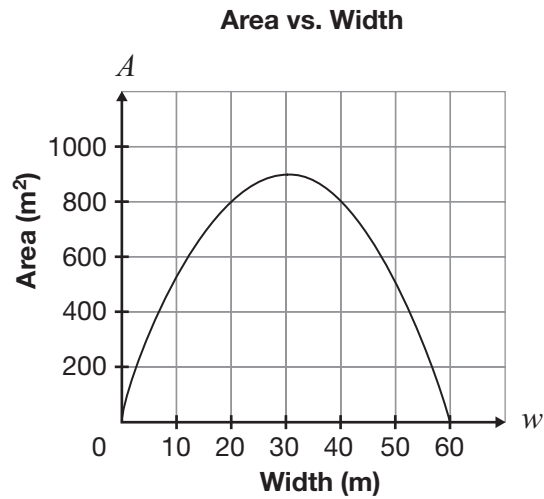


The total cost of bowling at Supreme Bowling is \$4 for shoe rental plus \$3 per game.

Complete the chart.

Ten Stripes Bowling	Supreme Bowling
The initial value is _____.	The initial value is _____.
Circle one: Direct variation Partial variation	Circle one: Direct variation Partial variation
Justification of choice of type of variation:	Justification of choice of type of variation:

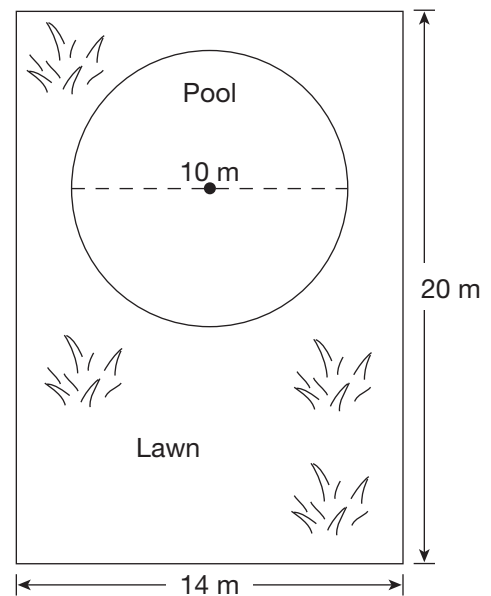
- 24** A rectangle is to have a perimeter of 120 m. The graph below shows the relationship between the area of the rectangle and its width.



What is the width of the rectangle with the largest area?

- a 30 m
- b 60 m
- c 120 m
- d 900 m

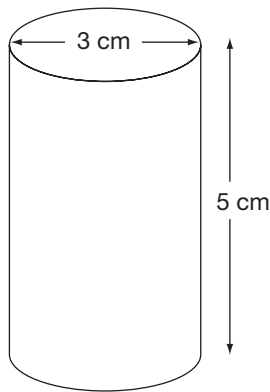
- 25** Gordon has a circular pool in his backyard, as shown below.



Which of the following is closest to the area of the lawn surrounding the pool?

- a 33.5 m^2
- b 34.2 m^2
- c 201.5 m^2
- d 248.6 m^2

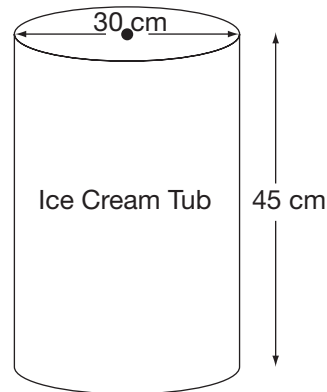
- 26** The water container below needs to be filled.



Which of the following represents the volume, in cm^3 , of water that fills the container?

- a $V = \pi(3^2)(5)$
- b $V = \pi(1.5)(5)$
- c $V = \pi(2 \times 3)(5)$
- d $V = \pi(1.5)^2(5)$

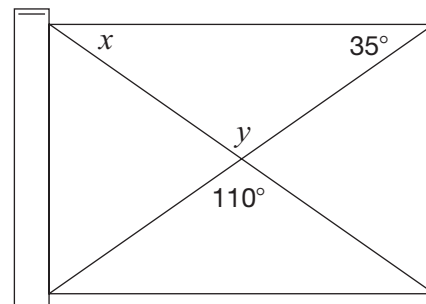
- 27** An ice cream shop sells ice cream cones that each contain an average of 525 cm^3 of ice cream. The ice cream is served from the following cylindrical tub.



About how many cones can be made from a full tub of ice cream with the dimensions shown?

- a 8
- b 16
- c 60
- d 242

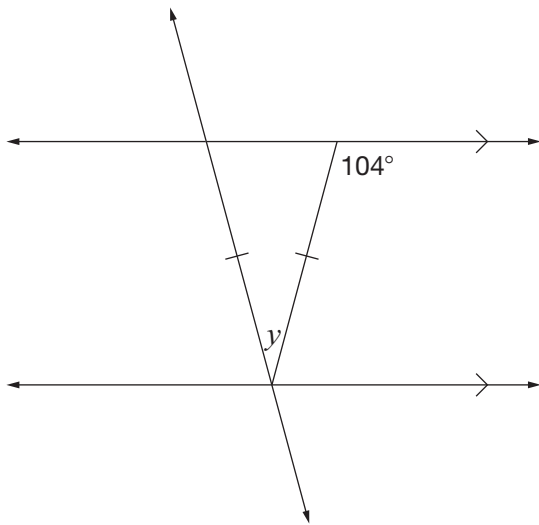
- 28** A carpenter is building a rectangular gate for a fence, as shown below.



What are the values of x and y ?

- a $x = 35^\circ, y = 110^\circ$
- b $x = 35^\circ, y = 145^\circ$
- c $x = 55^\circ, y = 110^\circ$
- d $x = 55^\circ, y = 145^\circ$

29 Consider the diagram below.



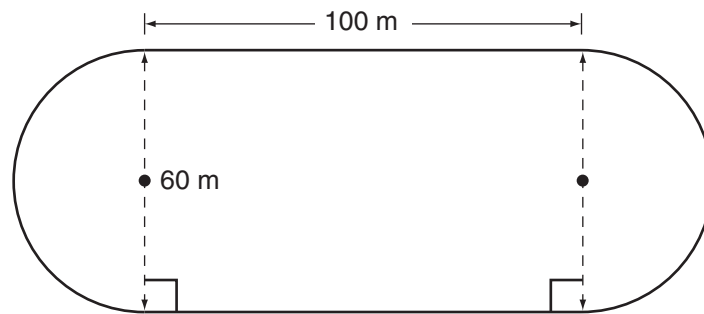
What is the value of y ?

- a 28°
- b 76°
- c 104°
- d 152°



30 Get Trackin'

Ashley runs around the following track.



How many times must she run around the track in order to run a total distance of 4 km?

Show your work.

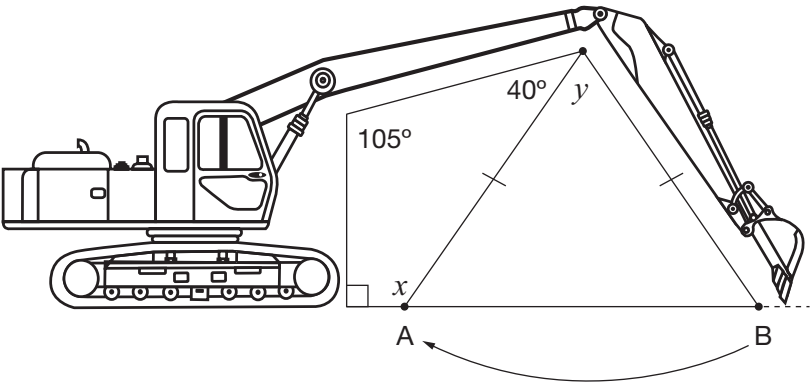
Hint:

$$1 \text{ km} = 1000 \text{ m}$$



31 Digging Around

A hydraulic arm swings from Point B to Point A, as shown in the diagram below.



Determine the values of x and y .
Justify your answers using geometric properties.

Value	Justification
$x =$ _____	
$y =$ _____	

Sample Assessment Questions: Applied

Student Answer Sheet

Your multiple-choice answers must be entered on this sheet.

- To indicate your answer, use an **HB pencil to fill in the circle completely**, as shown:

Like this: ● **Not like this:** ⊗ ✓ ◐ ◑

- If you fill in more than one answer to a question, the question will be scored zero.
- If you leave a question blank, the question will be scored zero.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. (a) (b) (c) (d)
6. (a) (b) (c) (d)
7. (a) (b) (c) (d)
8. Respond in booklet.

9. Respond in booklet.
10. (a) (b) (c) (d)
11. (a) (b) (c) (d)
12. (a) (b) (c) (d)
13. (a) (b) (c) (d)
14. (a) (b) (c) (d)
15. (a) (b) (c) (d)
16. (a) (b) (c) (d)

17. (a) (b) (c) (d)
18. (a) (b) (c) (d)
19. (a) (b) (c) (d)
20. (a) (b) (c) (d)
21. Respond in booklet.
22. Respond in booklet.
23. Respond in booklet.
24. (a) (b) (c) (d)

25. (a) (b) (c) (d)
26. (a) (b) (c) (d)
27. (a) (b) (c) (d)
28. (a) (b) (c) (d)
29. (a) (b) (c) (d)
30. Respond in booklet.
31. Respond in booklet.

End of Assessment

Print Student Name: _____

Student Signature: _____

Applied

Grade 9 Assessment of Mathematics

Winter 2009

SAMPLE ASSESSMENT QUESTIONS

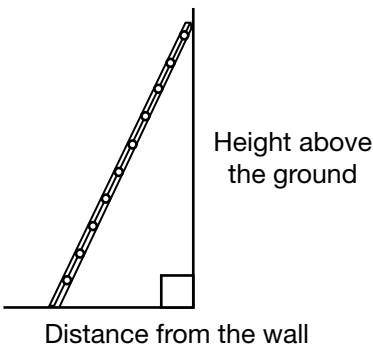
**Record your answers to the multiple-choice questions
on the blank Student Answer Sheet (Winter 2009, Applied).**

Education Quality and
Accountability Office



Please note: The format of
this booklet is different from
that used for the assessment.
The items themselves remain
the same.

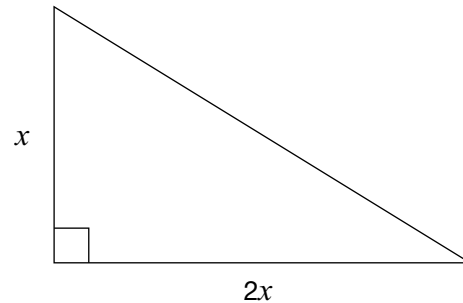
- 1** Sunita places a ladder against a wall. For safety reasons, the ratio of the height above the ground to the distance from the wall should be 5:2.



She places the top of the ladder 6.5 m above the ground. Which of the following is closest to the distance from the wall?

- a 2.6 m
 - b 3.3 m
 - c 5.4 m
 - d 16.3 m
- 2** Paper is sold in different-sized packages. Which package has the lowest cost per sheet?
- a \$1.00 for 150 sheets
 - b \$1.20 for 200 sheets
 - c \$2.50 for 500 sheets
 - d \$5.50 for 1000 sheets

- 3** A gardener designs a rose bed in the shape of a right triangle. The ratio of the two shorter sides is 2:1.



If the area is 25 square units, what are the dimensions of the shorter sides?

Hint: $A = \frac{bh}{2}$

- a 1, 2
 - b 1, 3
 - c 5, 5
 - d 5, 10
- 4** What is a simplified form of the expression $2x - 3 - 5x + 1$?
- a $3x - 2$
 - b $3x + 2$
 - c $-3x - 2$
 - d $-3x + 2$
- 5** What is the value of x that satisfies the equation $4x - 9 = 2x + 3$?
- a 2
 - b 3
 - c 5
 - d 6

6 Jobs

Peter has two part-time jobs. His earnings for one week are represented by the equation below:

$$E = 7.50r + 8.25v$$

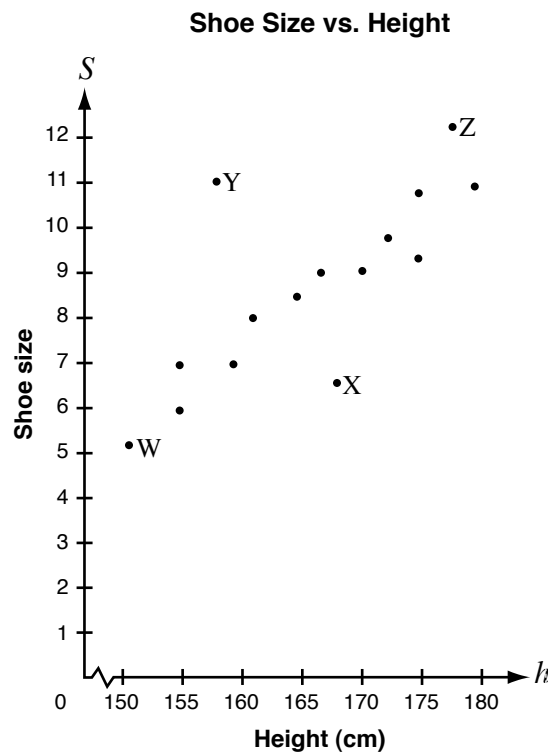
- E is his total earnings in one week;
- r is the number of hours he works at the restaurant and
- v is the number of hours he works at the video store.

Peter earns a total of \$117.75 in one week. If he works 8 hours at the restaurant, how many hours does he work at the video store?

Show your work.



- 7** The graph shows the shoe sizes of girls of various heights.

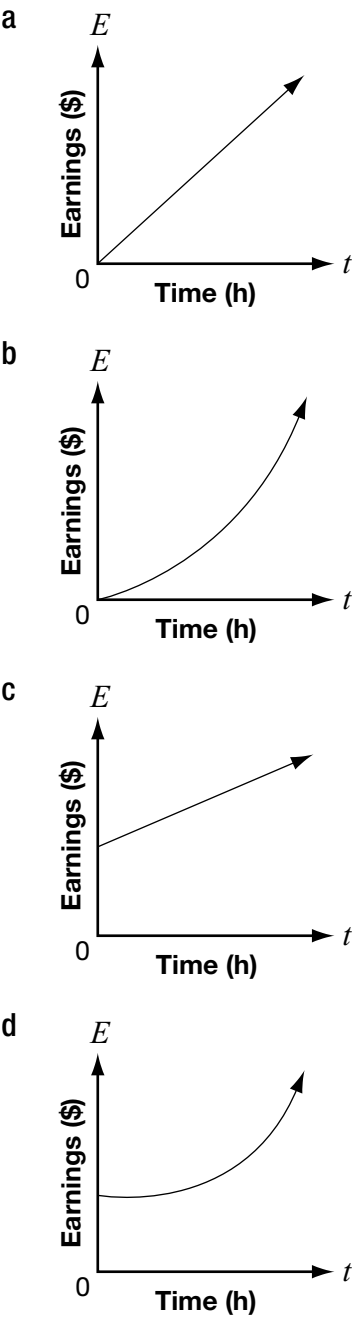


Which point represents a girl whose shoe size is smaller than expected for a girl of her height?

- a W
- b X
- c Y
- d Z

- 8** Koshen is creating his own summer gardening job. For each garden, he will charge a \$10 initial consultation fee plus \$8 per hour.

Which graph best represents Koshen’s earnings for each garden?



- 9** Which of the following tables represents a non-linear relation?

a

n	C
0	7
2	11
4	15
6	19
8	23

b

n	C
0	16
1	13
2	10
3	7
4	4

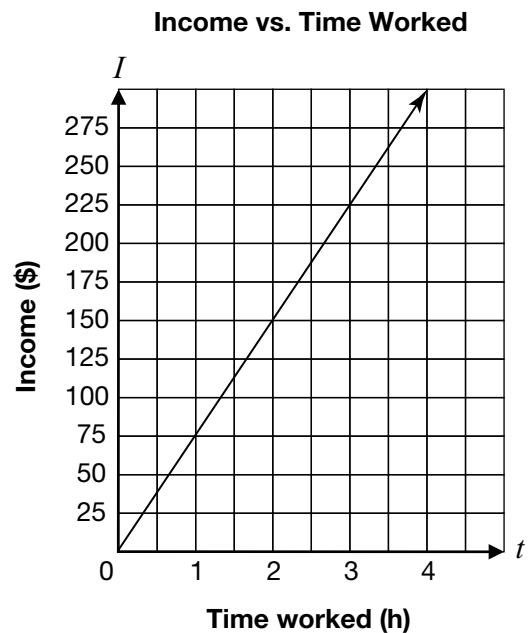
c

n	C
0	12
2	10
4	8
6	6
8	4

d

n	C
0	1
1	2
2	4
3	7
4	11

- 10** Joe owns an auto-repair shop. He charges his customers an hourly rate for repairs. The relationship between his income and the amount of time he works is shown below.



What is Joe's hourly rate?

- a** \$25/hour
- b** \$75/hour
- c** \$150/hour
- d** \$225/hour

- 11** A banquet hall charges a \$1500 rental fee, plus \$25 per person.

Which table below shows this relation?

a Banquet Charges

Number of people	Total cost (\$)
0	1500
5	1525

b Banquet Charges

Number of people	Total cost (\$)
0	1500
5	3000

c Banquet Charges

Number of people	Total cost (\$)
5	125
250	6250

d Banquet Charges

Number of people	Total cost (\$)
5	1625
250	7750

- 12** The cost, C , in dollars of producing n yearbooks is represented by the equation

$$C = 1000 + 5n.$$

How much would it cost to produce 75 yearbooks?

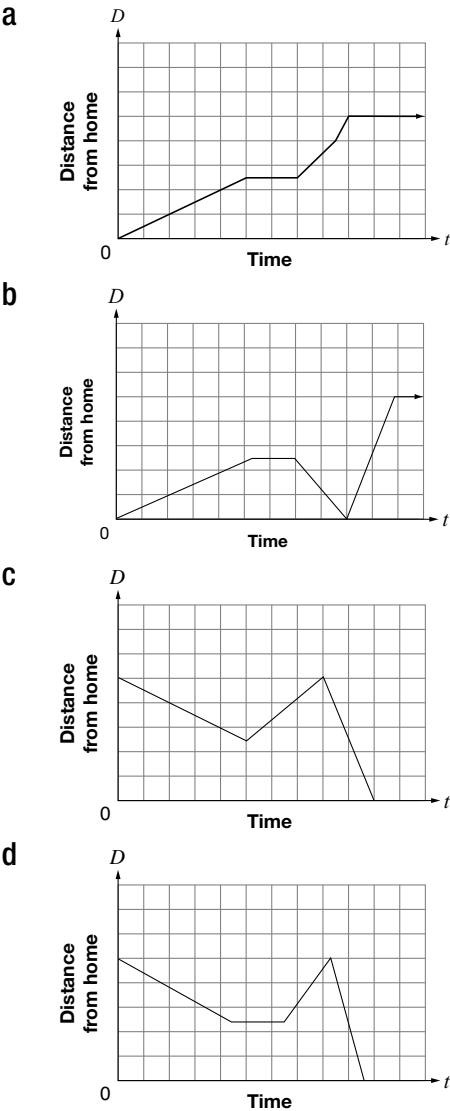
- a** \$375
b \$625
c \$1000
d \$1375



13 Maya's Trip to School

- Maya walks to her friend Kadeem's house, which is halfway between her home and the school.
- They stay at Kadeem's house for a few minutes, until Maya remembers that she has forgotten her lunch.
- Maya runs back home to get her lunch.
- When she gets home, her mother drives her to school so that she will not be late.

Which graph most accurately represents Maya's trip to school?

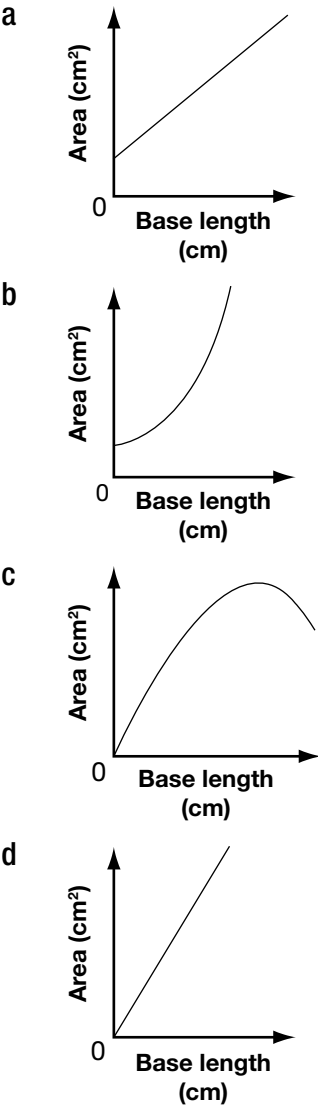


14 The data for five isosceles triangles with perimeters of 24 cm are shown below.

Triangles With 24 cm Perimeters

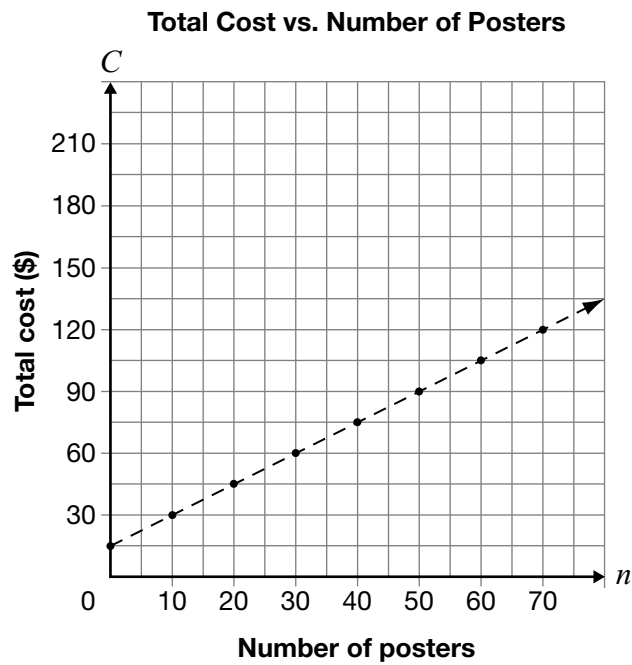
Length	Approximate Area of the Triangle
1 cm	6 cm ²
3 cm	16 cm ²
6 cm	25 cm ²
10 cm	24 cm ²
11 cm	19 cm ²

Which graph best represents the relationship between the base length and the area of the triangle?



15 Poster Printing

The total cost to print posters includes a set-up fee plus a charge per poster. The graph below represents the relationship between C , the total cost, and n , the number of posters printed.



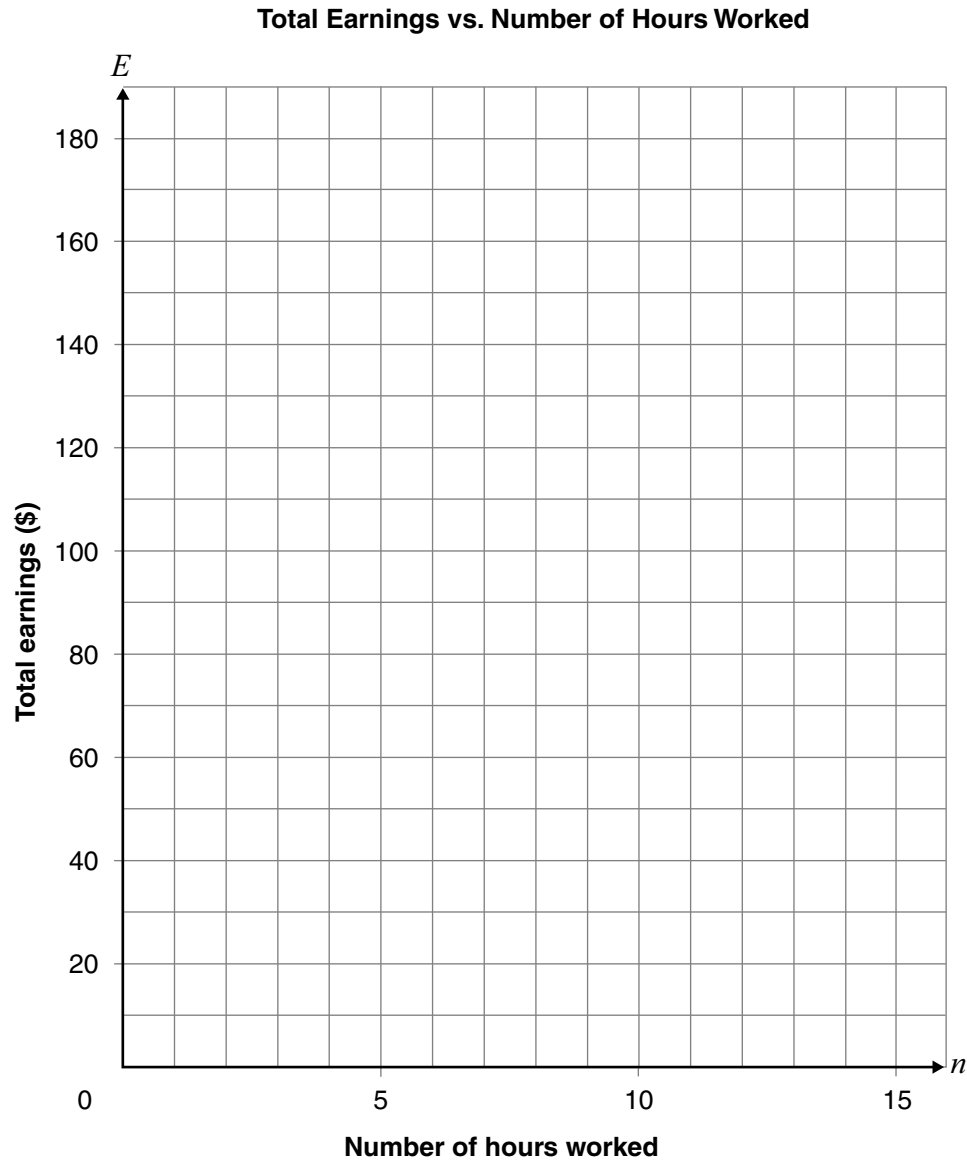
Determine the charge per poster.

Show your work.

16 Part-Time Jobs

Liz's new job offers a one-time bonus of \$30 and an hourly pay rate of \$10 per hour. Alex has a new job that pays \$15 per hour.

Graph each person's total earnings on the grid below. Label each line.

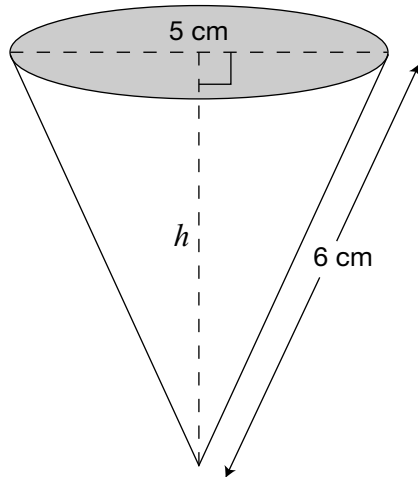


Determine where the lines intersect.

The lines intersect at _____.

What does this point represent?

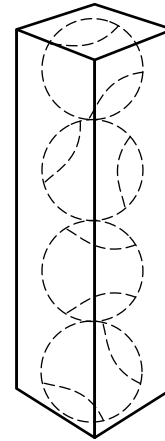
- 17** A cone-shaped water cup is shown below.



Which of the following is closest to the height of the cup, h ?

- a 3.3 cm
- b 3.5 cm
- c 5.5 cm
- d 8.5 cm

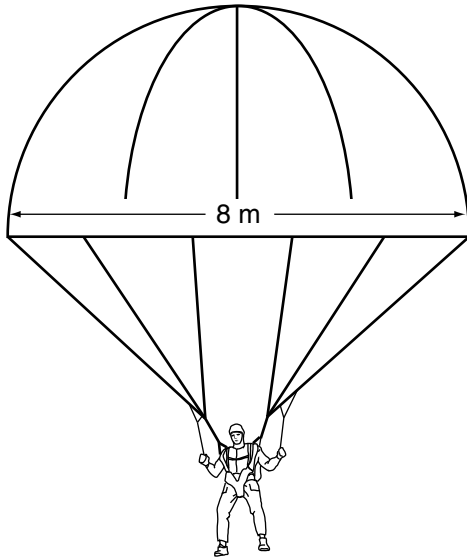
- 18** Tennis Inc. has decided to package 4 tennis balls in a box shaped like a rectangular prism. Tennis balls have a radius of 5 cm.



Which set of dimensions would tightly fit 4 tennis balls?

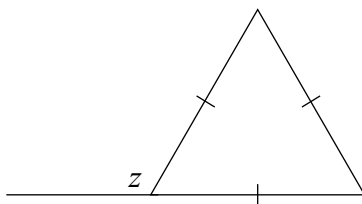
- a $5\text{ cm} \times 5\text{ cm} \times 20\text{ cm}$
- b $5\text{ cm} \times 5\text{ cm} \times 40\text{ cm}$
- c $10\text{ cm} \times 10\text{ cm} \times 10\text{ cm}$
- d $10\text{ cm} \times 10\text{ cm} \times 40\text{ cm}$

- 19** A fully opened parachute is shaped like a hemisphere and has a diameter of 8 m, as shown below.



Which of the following is closest to the volume of air that can fit in the fully opened parachute?

- a 134 m^3
 - b 268 m^3
 - c 1072 m^3
 - d 2145 m^3
- 20** What is the value z in the diagram below?

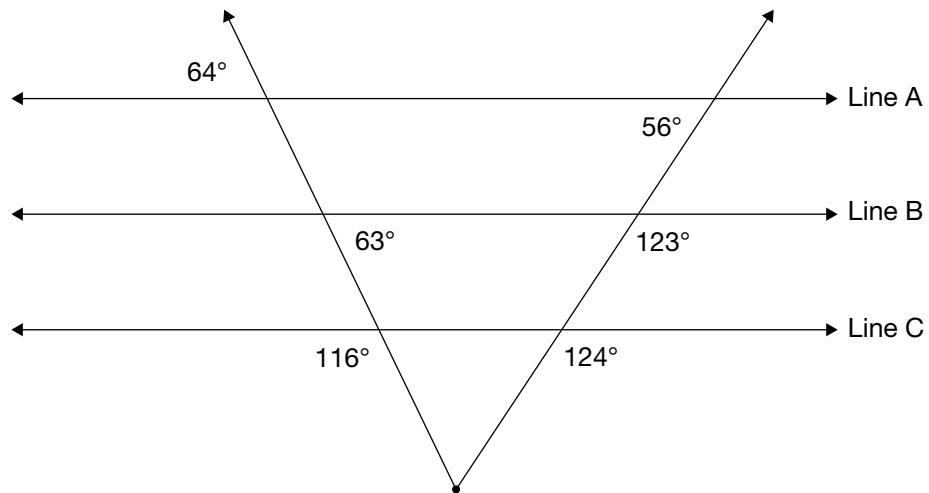


- a 60°
- b 100°
- c 120°
- d 140°



21 Parallel Illusions

Often lines that look parallel are not parallel.



Which two lines in the diagram above are parallel?

Justify your answer using geometric properties.

**Education Quality and
Accountability Office**



2 Carlton Street, Suite 1200, Toronto ON M5B 2M9

Telephone: 1-888-327-7377 Web site: www.eqao.com

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Sample Assessment Questions: Applied

Student Answer Sheet

Enter your multiple-choice answers on this sheet.

- To indicate your answer, use an **HB pencil to fill in the circle completely**, as shown below:

Like this: ● **Not like this:** ⊗ ✓ ◐ ◑

- If you fill in more than one answer to a question, the question will be scored incorrect.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. (a) (b) (c) (d)
6. Respond in booklet.

7. (a) (b) (c) (d)
8. (a) (b) (c) (d)
9. (a) (b) (c) (d)
10. (a) (b) (c) (d)
11. (a) (b) (c) (d)

12. (a) (b) (c) (d)
13. (a) (b) (c) (d)
14. (a) (b) (c) (d)
15. Respond in booklet.
16. Respond in booklet.

17. (a) (b) (c) (d)
18. (a) (b) (c) (d)
19. (a) (b) (c) (d)
20. (a) (b) (c) (d)
21. Respond in booklet.

End of Assessment

Print Student Name: _____

Student Signature: _____

Applied

Grade 9 Assessment of Mathematics

Spring 2009

SAMPLE ASSESSMENT QUESTIONS

**Record your answers to the multiple-choice questions
on the blank Student Answer Sheet (Spring 2009, Applied).**

Education Quality and
Accountability Office



Please note: The format of
this booklet is different from
that used for the assessment.
The items themselves remain
the same.

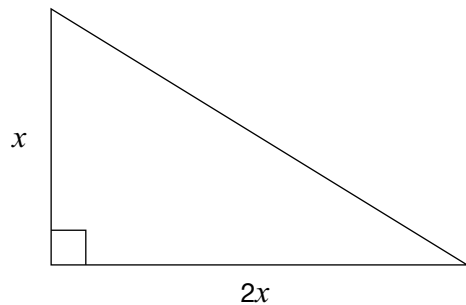
- 1** Darwin is making a drink that is a mix of crystals and water in a ratio of 2:5.

Darwin starts by mixing 4 cups of crystals with 9 cups of water.

How many more cups of water should he add to have a 2:5 ratio?

- a 0
- b 1
- c 2
- d 10

- 2** A gardener designs a rose bed in the shape of a right triangle. The ratio of the two shorter sides is 2:1.



If the area is 25 square units, what are the dimensions of the shorter sides?

Hint: $A = \frac{bh}{2}$

- a 1, 2
- b 1, 3
- c 5, 5
- d 5, 10

- 3** What is a simplified form of the expression $2x - 3 - 5x + 1$?

- a $3x - 2$
- b $3x + 2$
- c $-3x - 2$
- d $-3x + 2$

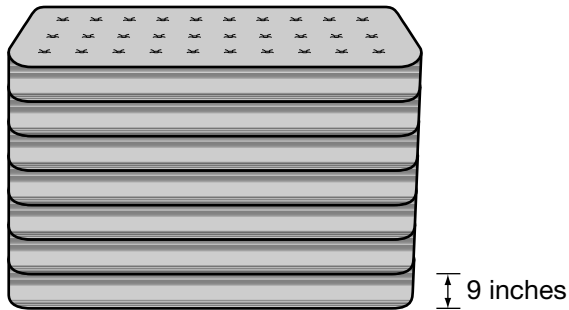
- 4** What is the value of x that satisfies the equation $4x - 9 = 2x + 3$?

- a 2
- b 3
- c 5
- d 6



5 Stacked High

A mattress company has 7000 mattresses to sell. The company claims that if all the mattresses are stacked on top of each other, the stack will be 3 times the height of the CN Tower.

**Hint:**

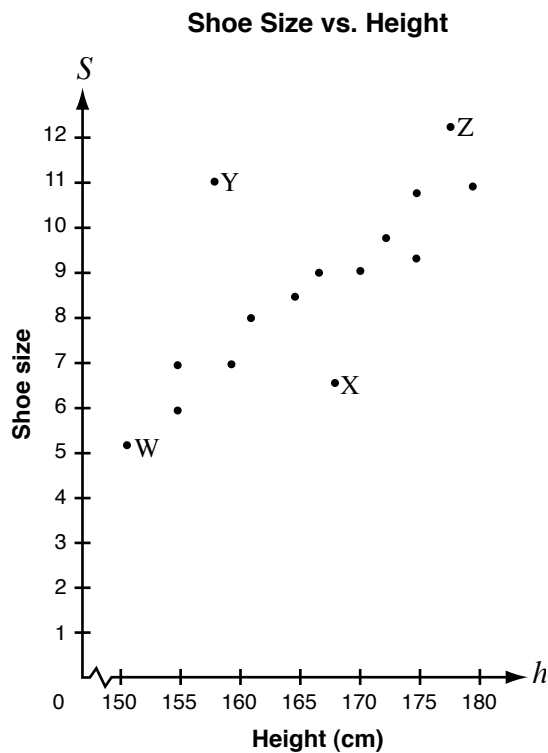
$$1 \text{ inch} = 2.5 \text{ cm}$$

$$1 \text{ m} = 100 \text{ cm}$$

The height of the CN Tower is 553 m and each mattress is 9 inches high. Is the company's claim true?

Justify your answer.

- 6 The graph shows the shoe sizes of girls of various heights.



Which point represents a girl whose shoe size is smaller than expected for a girl of her height?

- a W
- b X
- c Y
- d Z

- 7 Ali collects data to investigate how the area of the wall lit by an overhead projector increases as the projector moves away from the wall. The chart below shows Ali's data.

Distance from the wall (m)	Area on the wall (m ²)
1	1
2	4
3	9
4	16

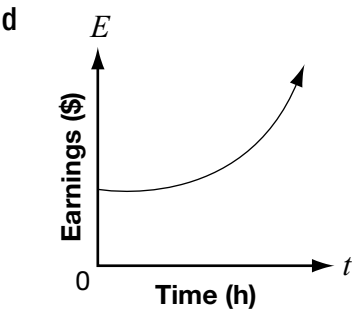
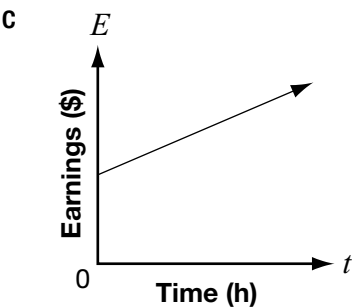
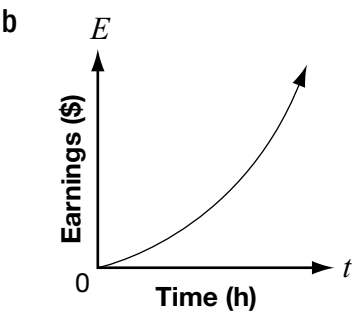
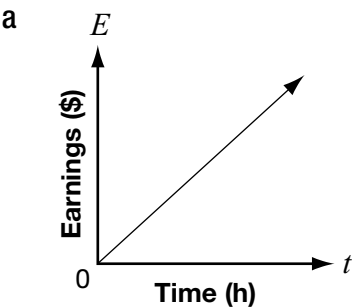
Which of the following trends does the data support?

As the distance increases, the area

- a increases at a constant rate.
- b decreases at a constant rate.
- c increases at an increasing rate.
- d decreases at an increasing rate.

- 8** Koshen is creating his own summer gardening job. For each garden, he will charge a \$10 initial consultation fee plus \$8 per hour.

Which graph best represents Koshen’s earnings for each garden?



- 9** Which of the following tables represents a non-linear relation?

a

n	C
0	7
2	11
4	15
6	19
8	23

b

n	C
0	16
1	13
2	10
3	7
4	4

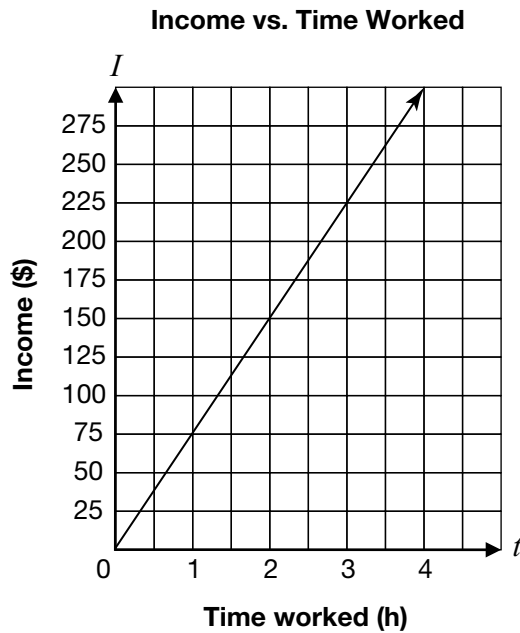
c

n	C
0	12
2	10
4	8
6	6
8	4

d

n	C
0	1
1	2
2	4
3	7
4	11

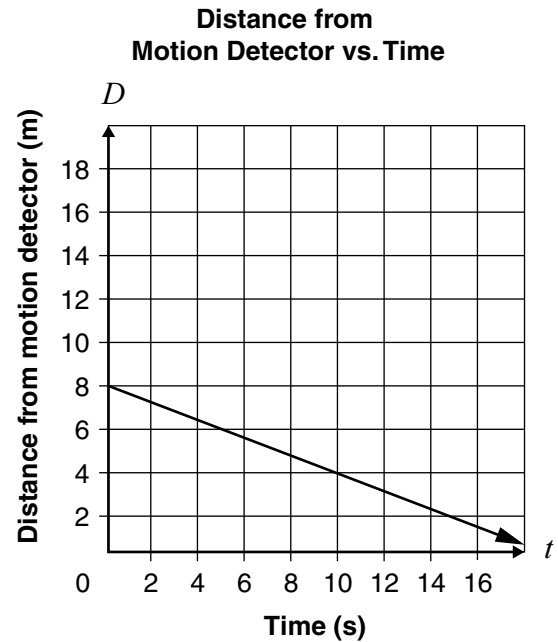
- 10** Joe owns an auto-repair shop. He charges his customers an hourly rate for repairs. The relationship between his income and the amount of time he works is shown below.



What is Joe's hourly rate?

- a \$25/hour
- b \$75/hour
- c \$150/hour
- d \$225/hour

- 11** The graph below shows the relationship between Rick's distance from a motion detector and the time he walks.



Which equation represents Rick's distance, D , from the motion detector based on time, t ?

- a $D = -\frac{2}{5}t + 8$
- b $D = \frac{2}{5}t + 8$
- c $D = -\frac{5}{2}t + 8$
- d $D = \frac{5}{2}t + 8$

- 12** The cost, C , in dollars of producing n yearbooks is represented by the equation

$$C = 1000 + 5n.$$

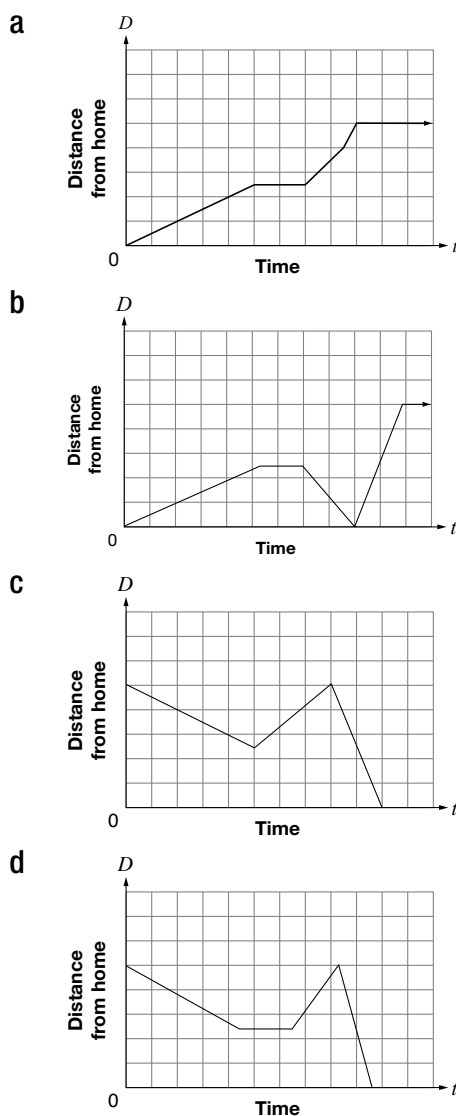
How much would it cost to produce 75 yearbooks?

- a \$375
- b \$625
- c \$1000
- d \$1375

13 **Maya's Trip to School**

- Maya walks to her friend Kadeem's house, which is halfway between her home and the school.
- They stay at Kadeem's house for a few minutes, until Maya remembers that she has forgotten her lunch.
- Maya runs back home to get her lunch.
- When she gets home, her mother drives her to school so that she will not be late.

Which graph most accurately represents Maya's trip to school?

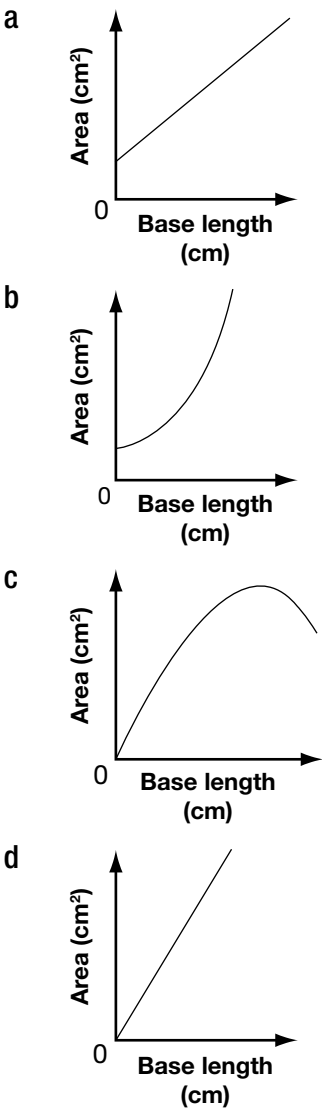


14 The data for five isosceles triangles with perimeters of 24 cm are shown below.

Triangles With 24 cm Perimeters

Length	Approximate Area of the Triangle
1 cm	6 cm ²
3 cm	16 cm ²
6 cm	25 cm ²
10 cm	24 cm ²
11 cm	19 cm ²

Which graph best represents the relationship between the base length and the area of the triangle?



15 Ripples in the Pond

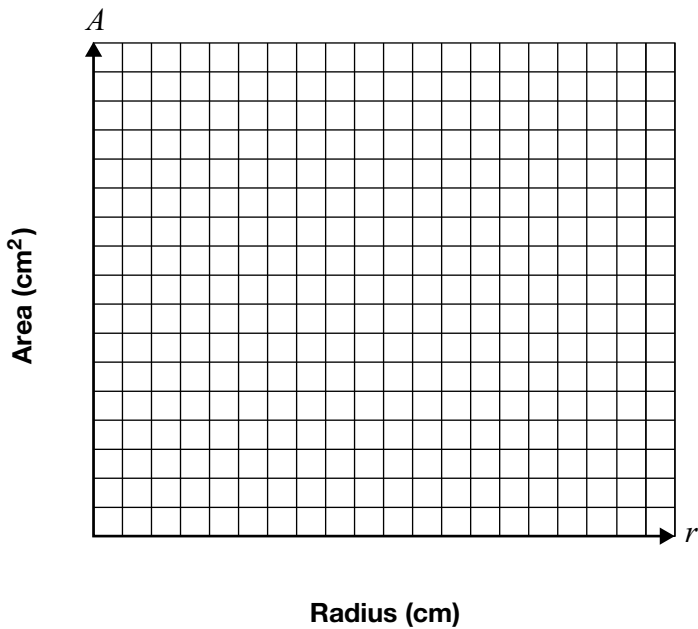
Quinn drops a pebble into a shallow pond and watches a circular wave ripple outward. The area of the circle increases as the radius increases.

Complete the table.

Radius (cm)	Area (cm ²)
0	
1	
2	
3	
4	
5	

Hint: Area of circle = πr^2

Graph these data below. Choose and label an appropriate scale for each axis.



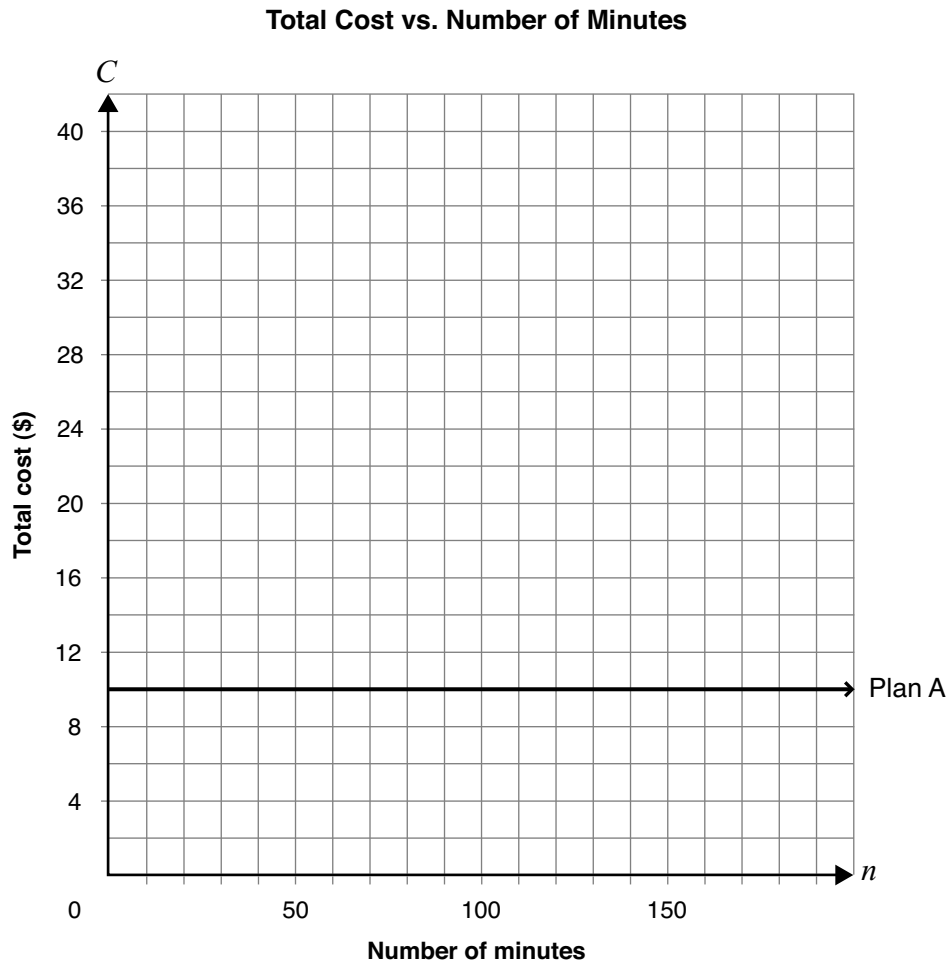
Draw a line or curve of best fit.

16 I'll Call You

Jasdeep has two options for long-distance phone calls.

- Plan A, as shown on the graph below, charges \$10.00 per month for unlimited minutes.
- Plan B charges \$0.20 per minute with no initial fee.

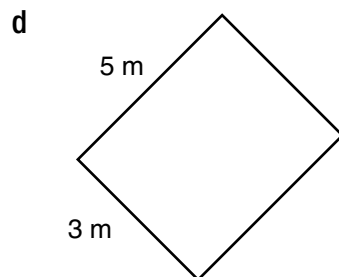
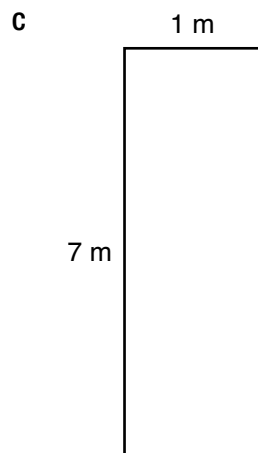
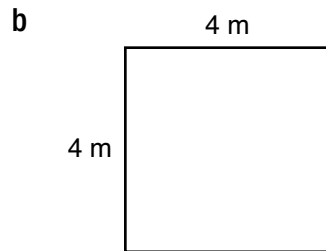
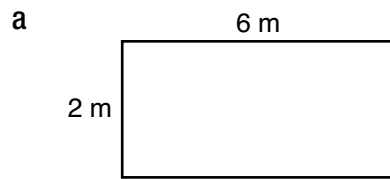
Graph Plan B on the grid below.



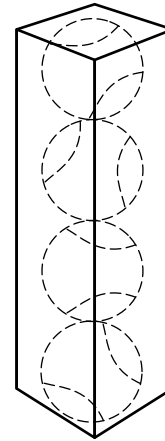
Determine under which conditions Jasdeep should select each plan.

Justify your answer.

- 17** Which of the following rectangles provides the maximum area for a perimeter of 16 m?



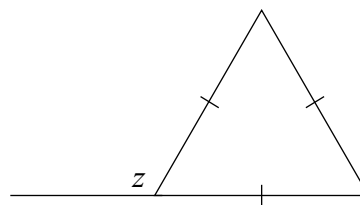
- 18** Tennis Inc. has decided to package 4 tennis balls in a box shaped like a rectangular prism. Tennis balls have a radius of 5 cm.



Which set of dimensions would tightly fit 4 tennis balls?

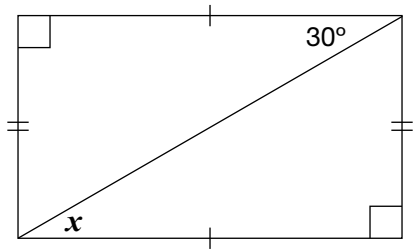
- a** $5\text{ cm} \times 5\text{ cm} \times 20\text{ cm}$
- b** $5\text{ cm} \times 5\text{ cm} \times 40\text{ cm}$
- c** $10\text{ cm} \times 10\text{ cm} \times 10\text{ cm}$
- d** $10\text{ cm} \times 10\text{ cm} \times 40\text{ cm}$

- 19** What is the value z in the diagram below?



- a** 60°
- b** 100°
- c** 120°
- d** 140°

- 20** Consider the diagram below.



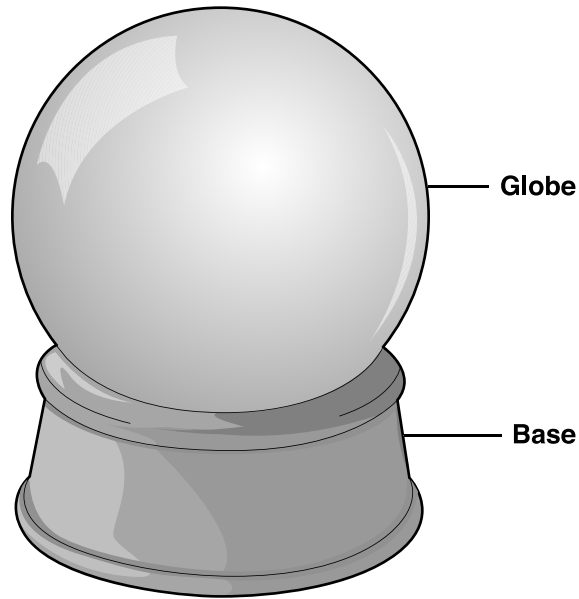
What is the value of x in the diagram?

- a 150°
- b 90°
- c 60°
- d 30°



21 Global Gift Shop

A gift shop sells water-filled spherical globes that sit on bases.



There are two sizes to choose from.

- A small globe has a radius of 6 cm.
- A large globe has a radius of 18 cm.

Mary thinks that the volume of water contained by the large globe is about three times the volume of water in the small globe.

Is she correct?

Circle one: Yes No

Justify your answer.

Sample Assessment Questions: Applied

Student Answer Sheet

Enter your multiple-choice answers on this sheet.

- To indicate your answer, use an **HB pencil to fill in the circle completely**, as shown below:

Like this: ● **Not like this:** ⊗ ✓ ◐ ◑

- If you fill in more than one answer to a question, the question will be scored incorrect.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. Respond in booklet.
6. (a) (b) (c) (d)

7. (a) (b) (c) (d)
8. (a) (b) (c) (d)
9. (a) (b) (c) (d)
10. (a) (b) (c) (d)
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14. (a) (b) (c) (d)
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16. Respond in booklet.

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18. (a) (b) (c) (d)
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21. Respond in booklet.

End of Assessment

Print Student Name: _____

Student Signature: _____

Applied

Grade 9 Assessment of Mathematics

Winter 2008

SAMPLE ASSESSMENT QUESTIONS

**Record your answers to the multiple-choice questions
on the blank Student Answer Sheet (Winter 2008, Applied).**

Education Quality and
Accountability Office



Please note: The format of these booklets is slightly different from that used for the assessment. The items themselves remain the same.

- 1** A carton that holds 500 mL of chocolate milk costs \$2.29.

Which of the following containers has a lower cost per mL?

- a 250 mL at \$1.29
- b 700 mL at \$3.09
- c 750 mL at \$3.59
- d 1000 mL at \$4.69

- 2** Which of the following fractions is **not** equivalent to $\frac{10}{30}$?

- a $\frac{2}{6}$
- b $\frac{15}{35}$
- c $\frac{1}{3}$
- d $\frac{100}{300}$

- 3** Aidan is buying a new CD player. The CD player was selling for \$84.79 and now is on sale for 25% off. Which of the following is closest to the total cost of the CD player, including 15% sales tax?

- a \$54.05
- b \$63.59
- c \$73.13
- d \$74.49

- 4** What is the value of the expression

$$-1 + \frac{77}{100}?$$

- a $-\frac{177}{100}$
- b $-\frac{78}{100}$
- c $-\frac{76}{100}$
- d $-\frac{23}{100}$

- 5** The volume of a cylinder is 325 cm^3 . The height is 8.5 cm.

Which is closest to the measure of the radius?

Hint: $V = \pi r^2 h$

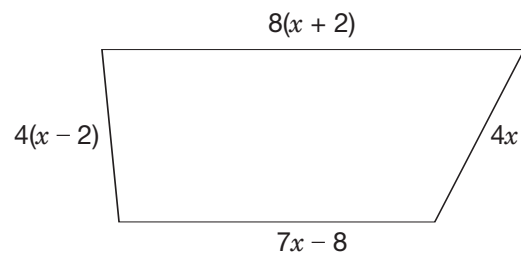
- a 3.49 cm
- b 6.09 cm
- c 12.17 cm
- d 38.24 cm

- 6** What is the solution to the equation $3x + 80 = 12x - 1$?

- a -27
- b -9
- c 9
- d 27

7 Field Maintenance

A field in the shape of a trapezoid has a perimeter of 460 m. A fence is being built along the field's perimeter.

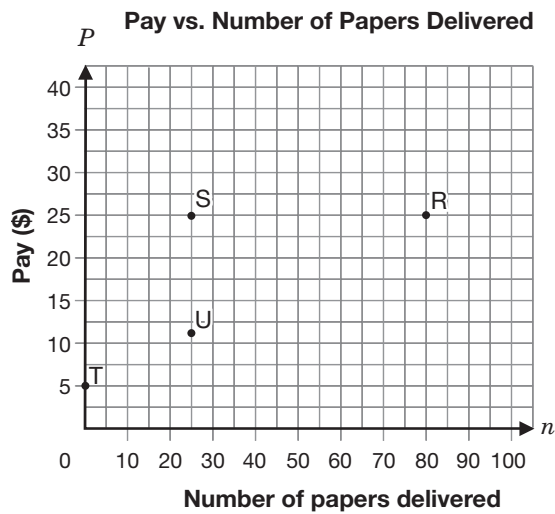


Determine the length of fencing needed for each side of the field.

Show your work.



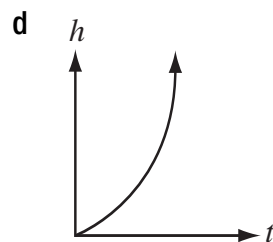
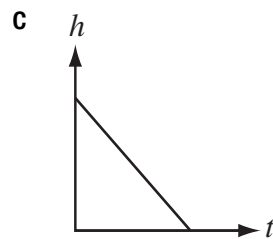
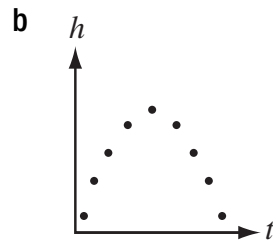
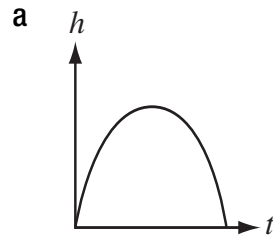
- 8** Mia delivers the local newspaper. Her base pay is \$5 per week, and she gets \$0.25 per paper.



Which of the points on the graph represents Mia's pay for delivering 25 newspapers in a week?

- a Point R
- b Point S
- c Point T
- d Point U

- 9** Which of the following graphs represents a linear relation?



- 10** Simon records the height of a plant each day for five days.

Plant Growth Over Five Days

Day	Height (cm)
0	4
1	5
2	7
3	10
4	14

His chart shows that the relation between height and day

- a** is a linear relation.
- b** is a non-linear relation.
- c** has a constant rate of change.
- d** has a decreasing rate of change.

- 11** Victoria is selling chocolate bars to raise money for her hockey team. She begins with 36 bars to sell and sells four bars per day.

Which of the following represents the relation between N , the number of chocolate bars remaining, and d , the number of days she has been selling?

- a** $N = 36 + 4d$
- b** $N = 36d - 4$

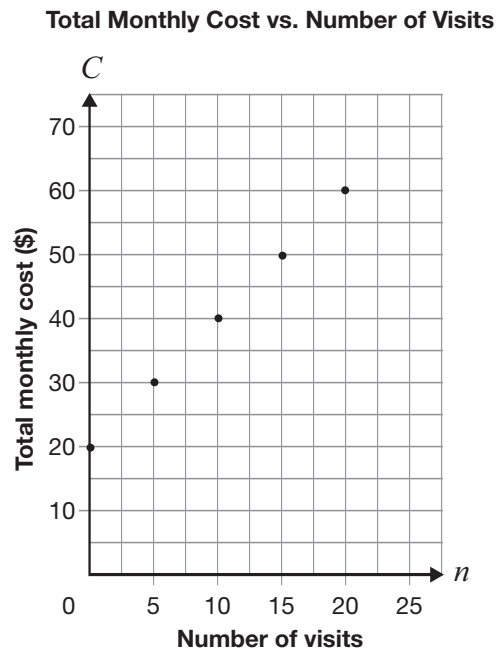
c

Day, d	Number of bars remaining, N	First differences
0	20	
1	24	4
2	28	4
3	32	4
4	36	4

d

Day, d	Number of bars remaining, N	First differences
0	36	
1	32	-4
2	28	-4
3	24	-4
4	20	-4

- 12** Tyler belongs to a fitness club at the community centre. The graph below represents the relationship between the number of times he visits the club and his total monthly cost.



What type of variation is this relationship, and what is the initial value?

- a Direct variation, and initial value is 0
- b Partial variation, and initial value is 0
- c Direct variation, and initial value is 20
- d Partial variation, and initial value is 20

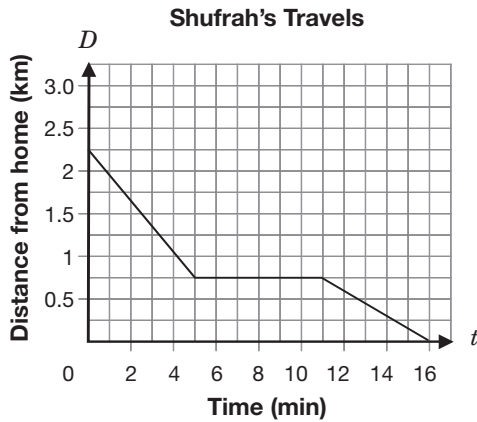
- 13** A tap is leaking into a pail. The height of the water in the pail is represented by the equation $h = 0.5t + 2$, where h represents the height of water in the pail, in cm, and t represents the amount of time the tap has been leaking, in minutes.

What is the height of water in the pail if the tap has been leaking for 56 minutes?

- a 28 cm
- b 30 cm
- c 108 cm
- d 114 cm



- 14** The relationship between t , the number of minutes Shufrah travels, and D , the distance she is from home, is shown on the grid below.



Which of the following statements best describes the way Shufrah travels?

- a While travelling toward her home, Shufrah rides her bike, stops and then walks.
- b While travelling toward her home, Shufrah rides her bike, walks and then rides her bike.
- c While travelling away from home, Shufrah rides her bike, stops and then walks.
- d While travelling away from home, Shufrah walks, rides her bike and then walks.



15 Makin’ a Profit!

Student council is planning a dance.

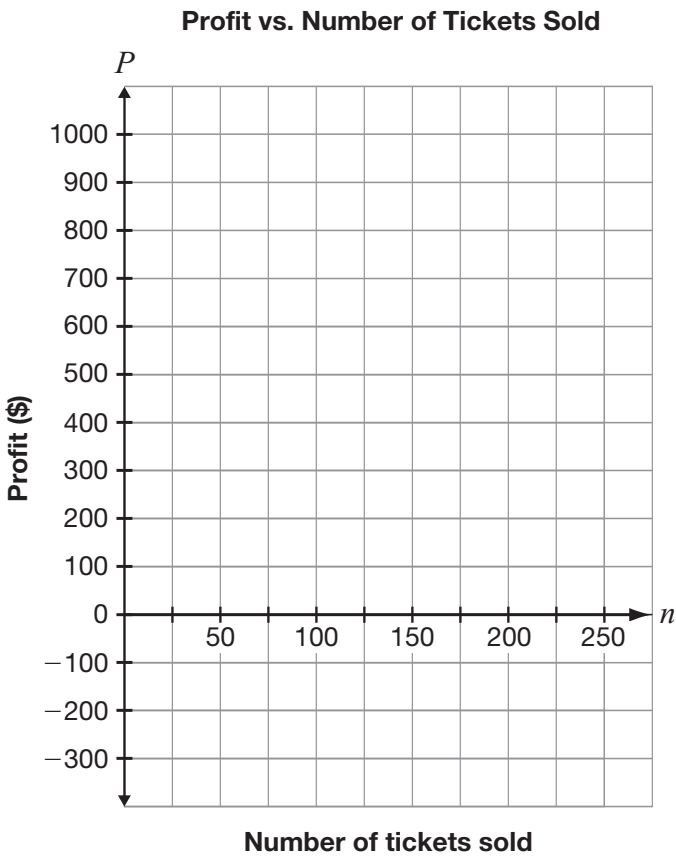
- The cost to hire a DJ is \$300.
- Tickets are sold at \$6 each.
- The profit is based on the amount received from the tickets sold minus the cost of the DJ.

Complete the table of values to show the profit based on the number of tickets sold.

Profit from Ticket Sales

Number of tickets sold	Profit (\$)
0	
50	
100	
150	
200	

Graph these data on the grid below.



16 Rockin' Radicals

The Radicals, a small high school band, recently signed a contract with a record label. Their earnings include a signing bonus plus an amount per CD sold, as shown in the table below.

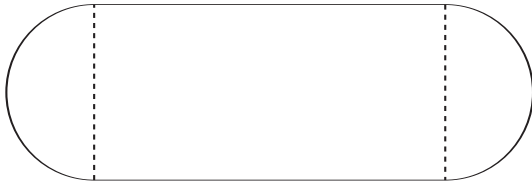
Number of CDs	Band earnings (\$)
0	10 000
5 000	10 600
10 000	11 200
15 000	11 800
20 000	12 400

Determine the amount of the signing bonus and the amount they receive per CD.

Show your work.

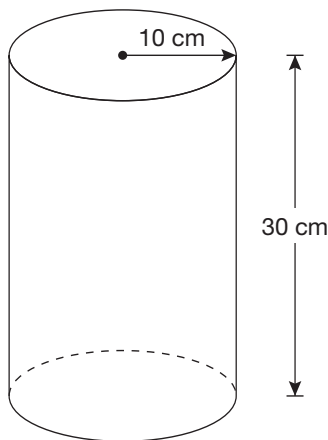


- 17** Germaine wants to calculate the area of the shape shown below. It is composed of a rectangle and two semicircles.



Which of the following pairs of expressions should Germaine use to determine the area of the shape?

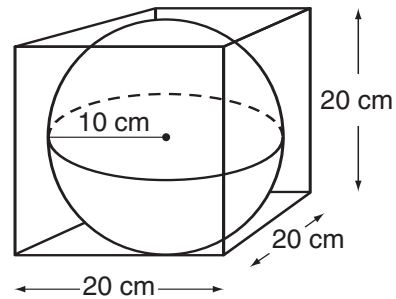
- a $2(l + w), \pi r^2$
 - b $2(l + w), 2\pi r$
 - c $lw, 2\pi r$
 - d $lw, \pi r^2$
- 18** Silvia is making lemonade. She is using a cylindrical container with a radius of 10 cm and a height of 30 cm, as shown below.



Which of the following is closest to the volume of the container?

- a $37\,700\text{ cm}^3$
- b 9425 cm^3
- c 1885 cm^3
- d 600 cm^3

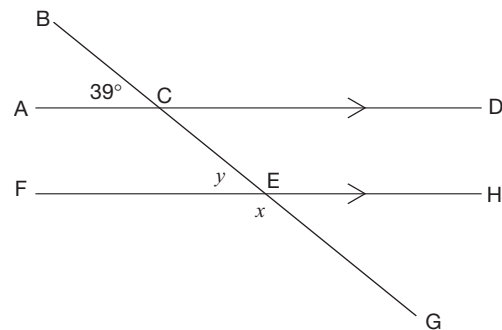
- 19** A soccer ball is packaged in a cube-shaped box.



Which is closest to the volume of the space in the package that is **not** occupied by the ball?

- a 3811 cm^3
- b 4000 cm^3
- c 4187 cm^3
- d 8000 cm^3

- 20** The measure of $\angle ACB$ is 39° .

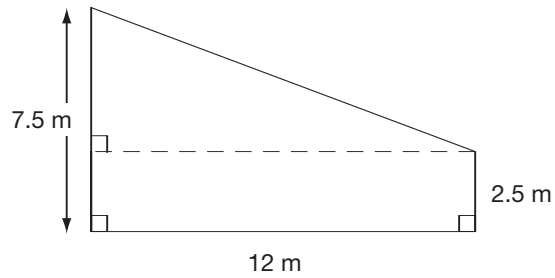


What are the values of x and y ?

- a $x = 39^\circ$ and $y = 141^\circ$
- b $x = 39^\circ$ and $y = 39^\circ$
- c $x = 141^\circ$ and $y = 141^\circ$
- d $x = 141^\circ$ and $y = 39^\circ$

21 Paint

Jackson is buying paint for his wall.



One litre of paint will cover 9 m^2 .

How many litres of paint does he need to cover the wall?

Justify your answer.

**Education Quality and
Accountability Office**



2 Carlton Street, Suite 1200, Toronto ON M5B 2M9

Telephone: 1-888-327-7377 Web site: www.eqao.com

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Sample Assessment Questions: Applied

Student Answer Sheet

Enter your multiple-choice answers on this sheet.

- To indicate your answer, use an **HB pencil to fill in the circle completely**, as shown below:

Like this: ● **Not like this:** ⊗ ✓ ◐ ○

- If you fill in more than one answer to a question, the question will be scored incorrect.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. (a) (b) (c) (d)
6. (a) (b) (c) (d)

7. Respond in booklet.

8. (a) (b) (c) (d)
9. (a) (b) (c) (d)
10. (a) (b) (c) (d)
11. (a) (b) (c) (d)

12. (a) (b) (c) (d)

13. (a) (b) (c) (d)

14. (a) (b) (c) (d)

15. Respond in booklet.

16. Respond in booklet.

17. (a) (b) (c) (d)

18. (a) (b) (c) (d)

19. (a) (b) (c) (d)

20. (a) (b) (c) (d)

21. Respond in booklet.

End of Assessment

Print Student Name: _____

Student Signature: _____

Applied

Grade 9 Assessment of Mathematics

Spring 2008

SAMPLE ASSESSMENT QUESTIONS

**Record your answers to the multiple-choice questions
on the blank Student Answer Sheet (Spring 2008, Applied).**

Education Quality and
Accountability Office



Please note: The format of these booklets is slightly different from that used for the assessment. The items themselves remain the same.

- 1** A carton that holds 500 mL of chocolate milk costs \$2.29.

Which of the following containers has a lower cost per mL?

- a 250 mL at \$1.29
- b 700 mL at \$3.09
- c 750 mL at \$3.59
- d 1000 mL at \$4.69

- 2** Which of the following fractions is **not** equivalent to $\frac{10}{30}$?

- a $\frac{2}{6}$
- b $\frac{15}{35}$
- c $\frac{1}{3}$
- d $\frac{100}{300}$

- 3** Aidan is buying a new CD player. The CD player was selling for \$84.79 and now is on sale for 25% off. Which of the following is closest to the total cost of the CD player, including 15% sales tax?

- a \$54.05
- b \$63.59
- c \$73.13
- d \$74.49

- 4** What is the value of the expression

$$-1 + \frac{77}{100}?$$

- a $-\frac{177}{100}$
- b $-\frac{78}{100}$
- c $-\frac{76}{100}$
- d $-\frac{23}{100}$

- 5** A rocket is fired upward from the ground. The equation below shows the relationship between h , the height of the rocket above the ground in metres, and t , the time in seconds.

$$h = 60t - 5t^2$$

Which of the following is the height of the rocket after 4 seconds?

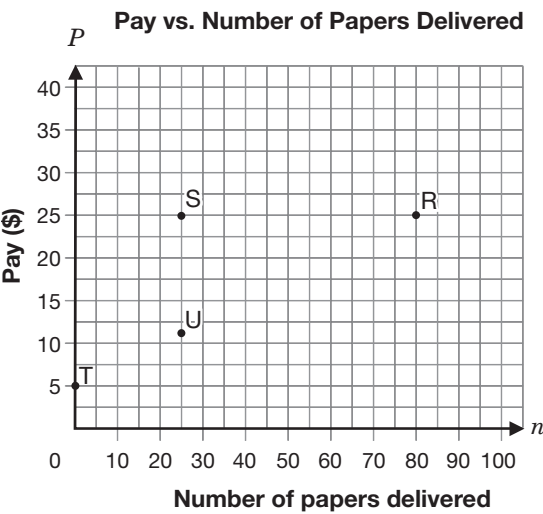
- a 35 m
- b 44 m
- c 160 m
- d 240 m

6 Clarence's Quandary

Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.



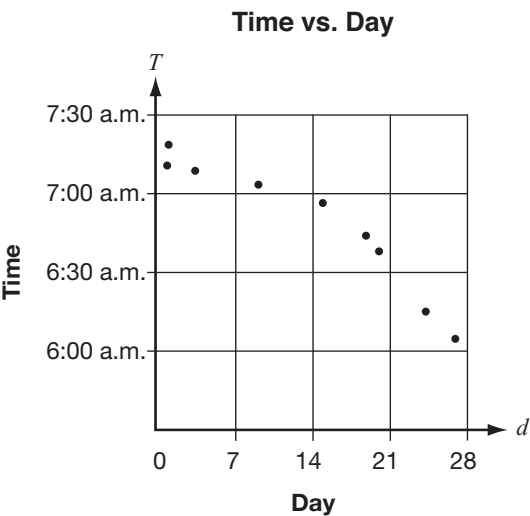
- 7** Mia delivers the local newspaper. Her base pay is \$5 per week, and she gets \$0.25 per paper.



Which of the points on the graph represents Mia’s pay for delivering 25 newspapers in a week?

- a Point R
- b Point S
- c Point T
- d Point U

- 8** Yves records the time of day that a street light turns off for 9 mornings over 28 days. The graph shows his data from the first day of the month.



Which statement describes the relation above?

- a The later in the month, the later the street light turns off.
- b The later in the month, the earlier the street light turns off.
- c The earlier in the month, the earlier the street light turns off.
- d There is no relationship between the day and the time the street light turns off.

- 9** Victoria is selling chocolate bars to raise money for her hockey team. She begins with 36 bars to sell and sells four bars per day.

Which of the following represents the relation between N , the number of chocolate bars remaining, and d , the number of days she has been selling?

- a $N = 36 + 4d$
b $N = 36d - 4$

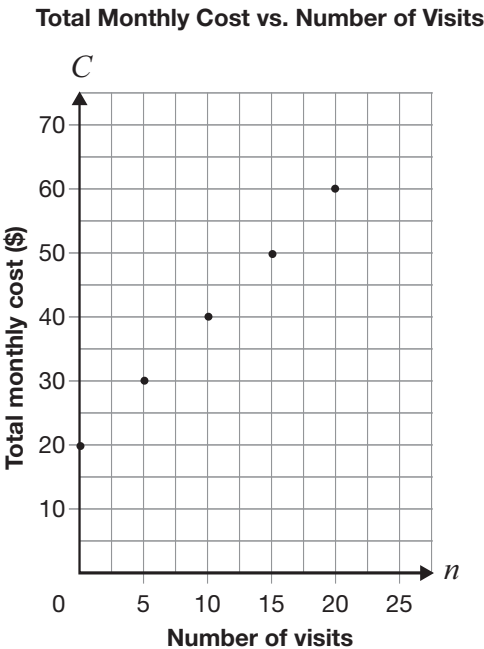
c

Day, d	Number of bars remaining, N	First differences
0	20	
1	24	4
2	28	4
3	32	4
4	36	4

d

Day, d	Number of bars remaining, N	First differences
0	36	
1	32	-4
2	28	-4
3	24	-4
4	20	-4

- 10** Tyler belongs to a fitness club at the community centre. The graph below represents the relationship between the number of times he visits the club and his total monthly cost.



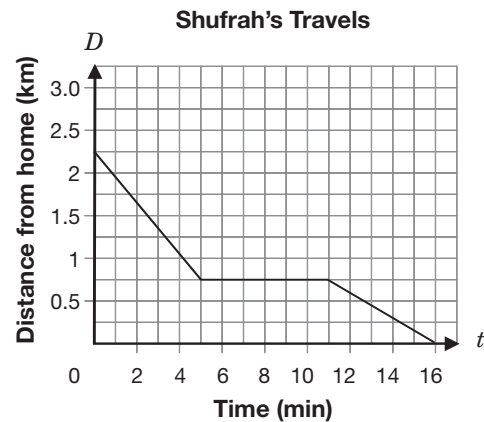
What type of variation is this relationship, and what is the initial value?

- a Direct variation, and initial value is 0
b Partial variation, and initial value is 0
c Direct variation, and initial value is 20
d Partial variation, and initial value is 20

- 11** Karl joins a fitness centre. The cost includes a one-time fee of \$100 plus a monthly fee of \$30. If C represents his total cost and n is the number of months, which equation represents this relationship?

- a $C = 130n$
- b $C = 100n + 30$
- c $C = 30n + 100$
- d $C = n + 130$

- 12** The relationship between t , the number of minutes Shufrah travels, and D , the distance she is from home, is shown on the grid below.



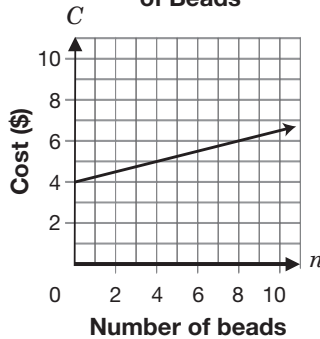
Which of the following statements best describes the way Shufrah travels?

- a While travelling toward her home, Shufrah rides her bike, stops and then walks.
- b While travelling toward her home, Shufrah rides her bike, walks and then rides her bike.
- c While travelling away from home, Shufrah rides her bike, stops and then walks.
- d While travelling away from home, Shufrah walks, rides her bike and then walks.

- 13** A jewellery store sells bead necklaces. Each necklace costs \$4 for the wire and \$0.25 per bead.

Select the answer below that represents this relation **correctly** in two ways. C is the cost in dollars and n is the number of beads.

a Cost vs. Number of Beads



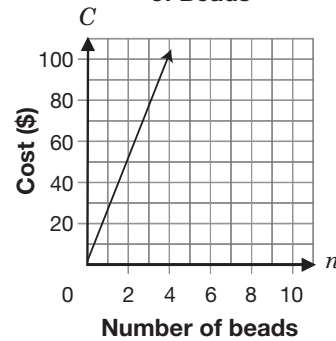
Number of beads, n	Cost, C \$
0	0
5	1.25
10	2.50
15	3.75
20	5.00

b $C = 4n + 0.25$

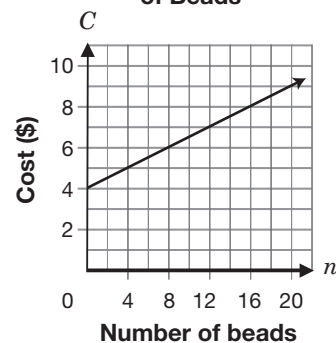
Number of beads, n	Cost, C \$
0	4.00
5	5.25
10	6.50
15	7.75
20	9.00

c $C = 0.25n + 4$

Cost vs. Number of Beads



d Cost vs. Number of Beads



Number of beads, n	Cost, C \$
0	4.00
5	5.25
10	6.50
15	7.75
20	9.00

- 14** U-Rent-Skates charges an \$8 fee, plus \$3.50 per hour to rent skates.

How long can Zara skate if she has a total of \$22 and still needs to keep \$1.50 for bus fare?

- a** 3 hours
b 4 hours
c 5 hours
d 6 hours

15 Starting Costs

A car rental company uses the equation $C = 20 + 0.15d$ to determine the cost of renting a car, where C is the total cost in dollars and d is the distance travelled in kilometres.

Determine the initial value and the rate of change.

Initial value _____

Rate of change _____

Describe how the initial value and the rate of change relate to the total cost of renting a car.



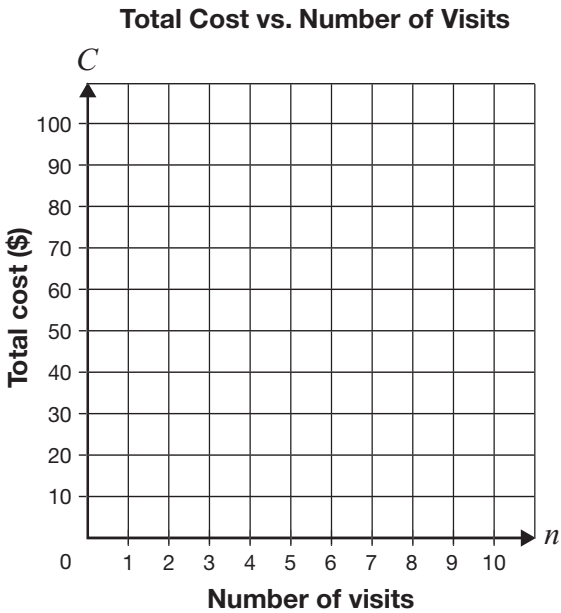
16 Let’s Go to a Water Park!

Two water parks have different methods of determining the cost of a season pass. The equations for both parks are given below, where C is the cost of the pass and n is the number of visits.

Wet Water World	
$C = 20 + 10n$	
Number of visits, n	Total cost, C (\$)
0	
2	
4	
6	
8	

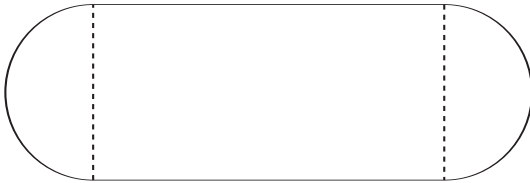
Bubbling Blue	
$C = 50 + 5n$	
Number of visits, n	Total cost, C (\$)
0	
2	
4	
6	
8	

Graph the costs for both water parks on the grid below.



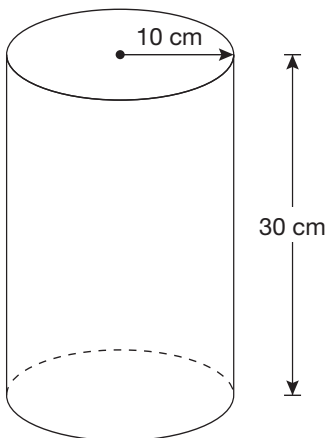
Determine which water park has the lower cost for a season pass.
Justify your answer.

- 17** Germaine wants to calculate the area of the shape shown below. It is composed of a rectangle and two semicircles.



Which of the following pairs of expressions should Germaine use to determine the area of the shape?

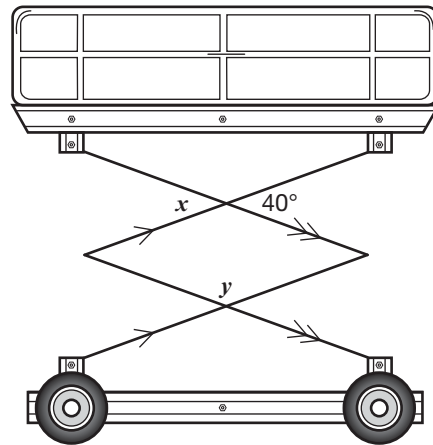
- a $2(l + w), \pi r^2$
 - b $2(l + w), 2\pi r$
 - c $lw, 2\pi r$
 - d $lw, \pi r^2$
- 18** Silvia is making lemonade. She is using a cylindrical container with a radius of 10 cm and a height of 30 cm, as shown below.



Which of the following is closest to the volume of the container?

- a $37\,700\text{ cm}^3$
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- d 600 cm^3

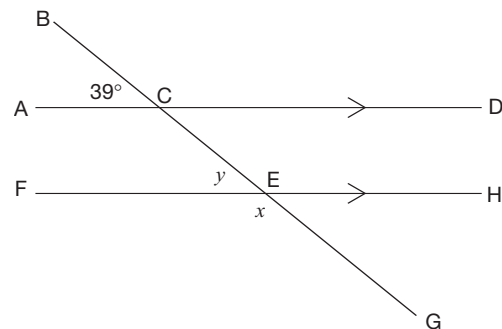
- 19** A custodian uses a lift to change light bulbs in the gym. A cross-section of the lift is shown below.



What are the values of x and y ?

- a $x = 40^\circ, y = 100^\circ$
- b $x = 40^\circ, y = 140^\circ$
- c $x = 50^\circ, y = 130^\circ$
- d $x = 50^\circ, y = 140^\circ$

- 20** The measure of $\angle ACB$ is 39° .

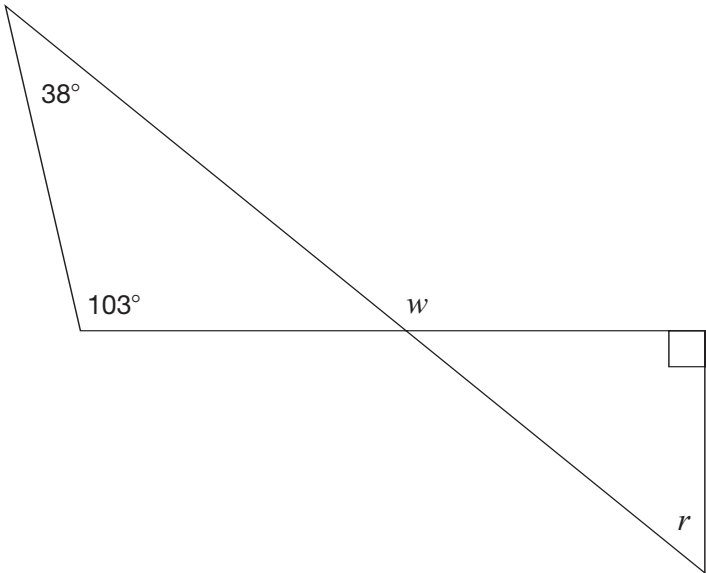


What are the values of x and y ?

- a $x = 39^\circ$ and $y = 141^\circ$
- b $x = 39^\circ$ and $y = 39^\circ$
- c $x = 141^\circ$ and $y = 141^\circ$
- d $x = 141^\circ$ and $y = 39^\circ$

21 Determining Degrees

Consider the following diagram.



Determine the values of r and w .

Justify your answer.

	Value	Justification
r		
w		

Sample Assessment Questions: Applied

Student Answer Sheet

Enter your multiple-choice answers on this sheet.

- To indicate your answer, use an **HB pencil to fill in the circle completely**, as shown below:

Like this: ● **Not like this:** ⊗ ✓ ◐ ⊙

- If you fill in more than one answer to a question, the question will be scored incorrect.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. (a) (b) (c) (d)
6. Respond in booklet.

7. (a) (b) (c) (d)
8. (a) (b) (c) (d)
9. (a) (b) (c) (d)
10. (a) (b) (c) (d)
11. (a) (b) (c) (d)

12. (a) (b) (c) (d)
13. (a) (b) (c) (d)
14. (a) (b) (c) (d)
15. Respond in booklet.
16. Respond in booklet.

17. (a) (b) (c) (d)
18. (a) (b) (c) (d)
19. (a) (b) (c) (d)
20. (a) (b) (c) (d)
21. Respond in booklet.

End of Assessment

Print Student Name: _____

Student Signature: _____

